SAMSUNG TECHWIN

NETWORK CAMERA

User Manual

SNP-6201/SNP-6201H

CE

SAMSUNG

Network Camera

User Manual

Copyright

©2014 Samsung Techwin Co., Ltd. All rights reserved.

Trademark

SAMSUNG TECHWIN is the registered logo of Samsung Techwin Co., Ltd.
The name of this product is the registered trademark of Samsung Techwin Co., Ltd.
Other trademarks mentioned in this manual are the registered trademark of their respective company.

Restriction

Samsung Techwin Co., Ltd shall reserve the copyright of this document. Under no circumstances, this document shall be reproduced, distributed or changed, partially or wholly, without formal authorization of Samsung Techwin.

Disclaimer

Samsung Techwin makes the best to verify the integrity and correctness of the contents in this document, but no formal guarantee shall be provided. Use of this document and the subsequent results shall be entirely on the user's own responsibility. Samsung Techwin reserves the right to change the contents of this document without prior notice.

- **Design and specifications are subject to change without prior notice.**
- **The initial administrator ID is "admin" and the password should be set when logging in for the first time. Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.**
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This product is intended to be supplied by a Listed power supply unit marked "Class 2" and rated from 12 V dc, min 0.9A.

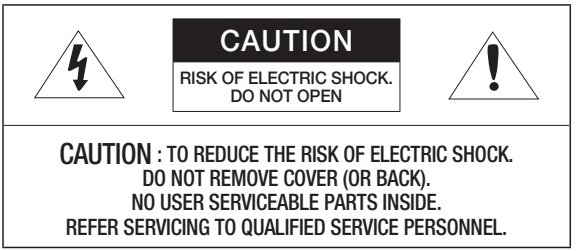
WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENNINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

CAUTION



EXPLANATION OF GRAPHICAL SYMBOLS

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Battery

Batteries(battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

CAUTION

Risk of explosion if battery is replaced by an incorrect type.
Dispose of used batteries according to the instructions.

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

The CVBS out terminal of the product is provided for easier installation, and is not recommended for monitoring purposes.

Please use the input power with just one camera and other devices must not be connected.

The ITE is to be connected only to PoE networks without routing to the outside plant.

overview

Please read the following recommend safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Do not expose the camera to radioactivity.

User's Manual is a guidance book for how to use the products.
The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product's usages
- Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction

※ Please read this manual for the safety before using of goods and keep it in the safe place.

CONTENTS

OVERVIEW 3

3 Important Safety Instructions
9 Product Features
10 Recomended PC Specifications
10 Recomended SD/SDHC Memory Card Specifications
11 What's Included
13 At a Glance (SNP-6201)
16 At a Glance (SNP-6201H)

INSTALLATION & CONNECTION 20

21 Connecting with other Device
24 Installation
35 Inserting/Removing a SD Memory Card
36 Memory Card Information (Not Included)

NETWORK CONNECTION AND SETUP 37

37 Connecting the Camera Directly to Local Area Networking
38 Connecting the Camera Directly to a DHCP Based DSL/Cable Modem
39 Connecting the Camera Directly to a PPPoE Modem
40 Connecting the Camera to a Broadband Router with the PPPoE/Cable Modem
41 Buttons used in IP Installer
42 Static IP Setup
46 Dynamic IP Setup
47 Port Range Forward (Port Mapping) Setup
49 Connecting to the Camera from a Shared Local PC
49 Connecting to the Camera from a Remote PC via the Internet

WEB VIEWER 50

50 Connecting to the Camera
51 Password setting
52 Login
53 Installing Silverlight Runtime
56 Installing STW WebViewer Plugin
58 Using the Live Screen
62 Playing the recorded video

SETUP SCREEN 68

68 Setup
68 Video & Audio Setup
92 Network Setup
101 Event Setup
119 System Setup

APPENDIX 127

127 DIP Switch Setting
137 Camera Wiring
138 Specification
143 Product Overview
145 Troubleshooting
147 Open source license notification on the product

PRODUCT FEATURES

- **Full HD Video Quality**
- **Multi-Streaming**
  This network camera can display videos in different resolutions and qualities simultaneously using different CODECs.
- **Web Browser-based Monitoring**
  Using the Internet web browser to display the image in a local network environment.
- **Alarm**
  If an event occurs, the event-related video will be transferred to the FTP/email specified by the user or saved to the SD memory, or the event signal will be sent to the Alarm Out port.
- **Tampering Detection**
  Detects tempering attempts on video monitoring.
- **Motion Detection**
  Detects motion from the camera's video input.
- **Intelligent Video Analysis**
  Analyzes video to detect logical events of specified conditions from the camera's video input.
- **Face Detection**
  Detects faces from the camera's video input.
- **Audio Detection**
  Detects sound louder than a certain level specified by user.
- **Auto Detection of Disconnected Network**
  Detects network disconnection before triggering an event.
- **ONVIF Compliance**
  This product supports ONVIF Profile-S.
  For more information, refer to www.onvif.org.

ONVIF
Driving network video through global standardization

RECOMENDED PC SPECIFICATIONS

- CPU : Intel Core 2 Duo 2.6GHz or higher
- Resolution : 1280X1024 pixels or higher
- RAM : 2GB or higher
- Supported OS : Windows XP / VISTA / 7, MAC OS X 10.7
- Supported Browser : Microsoft Internet Explorer (Ver. 10 ~ 7)
  Mozilla Firefox (Ver. 19 ~9) ※ Windows Only
  Google Chrome (Ver. 25 ~ 15) ※ Windows Only
  Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) ※ Mac OS X only
  - Windows 8 is supported only in the Desktop mode.
  - Neither a beta test version unlike the version released in the company website nor the developer version will be supported.
  - It is recommended to connect to IPv6 in Windows 7.
  - For Mac OS X, only the Safari browser is supported.
- Video Memory : 256MB or higher

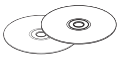
  - If the driver of the video graphic adapter is not installed properly or is not the latest version, the video may not be played properly.
  - For a multi-monitoring system involving at least 2 monitors, the playback performance can be deteriorated depending on the system.
  - It is advisable to use Intel Core 2 Duo 2.93GHz or higher in a multi-browser environment.

RECOMENDED SD/SDHC MEMORY CARD SPECIFICATIONS

- 4GB ~ 32GB
- For your camera, we recommend you use a memory card from the following manufacturers:
  SD/SDHC Memory Card : Sandisk, Transcend
- It is recommended to use memory cards of at least class 6 speed.

WHAT'S INCLUDED

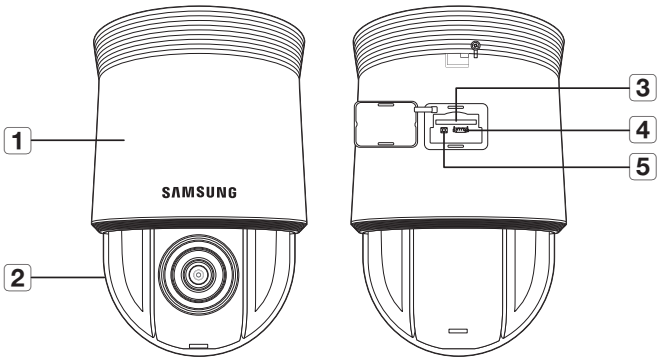
Please check if your camera and accessories are all included in the product package.

Appearance	Item Name	Quantity	Description	Model Name
	Camera	1		SNP-6201 or SNP-6201H
	Instruction book, Installer S/W CD, CMS S/W DVD	2		
	Quick Guide (Optional)	1		
	Warranty card (Optional)	1		
	Cable for the testing monitor	1	Used to test the camera connection to a portable display device	

Appearance	Item Name	Quantity	Description	Model Name
	Installation base	1	If installing it indoors or in a ceiling housing	SNP-6201
	Tapping Screw	4	Used for installation on the ceiling	
	Template	1	Product installation guide	
	Insulation Sheet	1	Use when installing the camera at highly humid place	
	Hexagon screw	3	Used for attaching the installation base to the camera	SNP-6201H
	L Wrench	1	Used for fixing the installation base after attaching it to the camera	
	Installation base	1	Bracket for mounting outdoors	

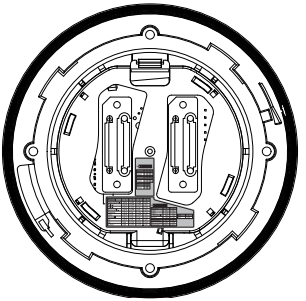
AT A GLANCE (SNP-6201)

Appearance

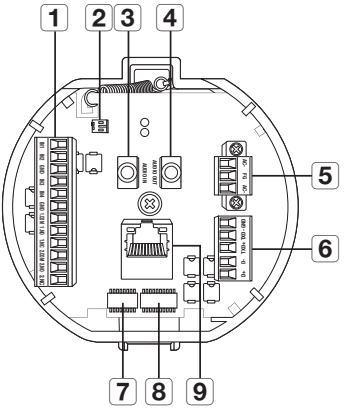


Item	Description
1 Main unit	Protects the internal PTZ mechanism from the direct sunlight or external impact.
2 Dome Cover	Dome cover for the lens and unit protection.
3 SD Memory Card Compartment	Compartment for the SD memory card.
4 After Service Port (A/S port)	This is for the repair purpose only that is not available for the user.
5 Reset Button	Pressing and holding this button for about 5 seconds will reset all camera settings to the factory default.

Bottom View of Installation Base



Inner View of Installation Base

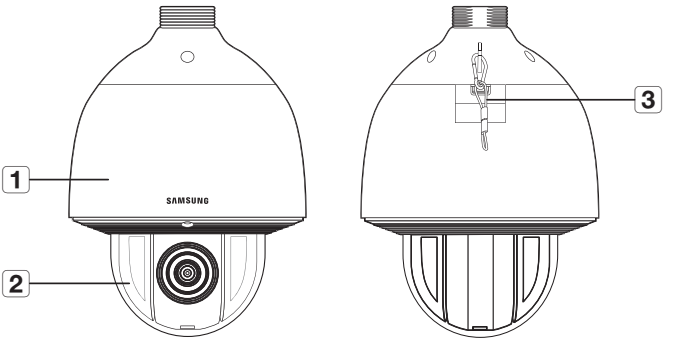


Item	Description
1 Alarm I/O Port	Used to connect the alarm I/O cable.
2 Video Out Port	Analog video output port. (for installation)
3 Audio Input Port	Used to connect the audio input cable.
4 Audio Output Port	Used to connect the audio output cable.
5 Power Port	Used to connect the power.

Item	Description
6 Communications Ports	Used for RS-485/422 communications.
7 ID Setup Switch	Specify the camera ID.
8 Communications Setup Switch	Set the transfer rate and protocols.
9 Network Connections	You can use a PoE+ or an Ethernet cable to connect this terminal to the network.

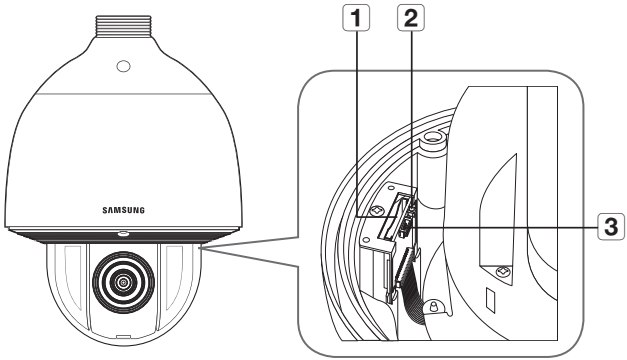
AT A GLANCE (SNP-6201H)

Appearance



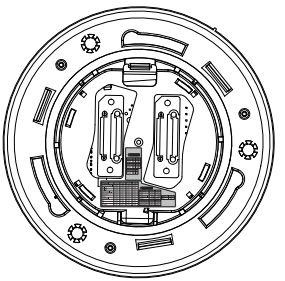
Item	Description
1 Main unit	Protects the internal PTZ mechanism from the direct sunlight, rain or external impact.
2 Dome Cover	Dome cover for the lens and unit protection.
3 Safety Cable	The cable prevents the product from dropping during installation.

Inside

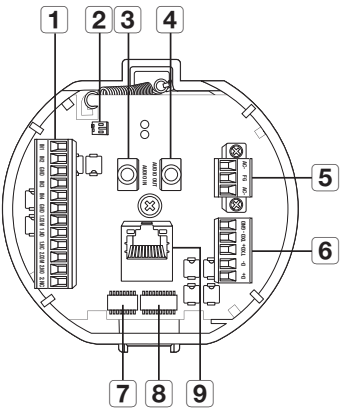


Item	Description
1 SD Memory Card Compartment	Compartment for the SD memory card.
2 Reset Button	Pressing and holding this button for about 5 seconds will reset all camera settings to the factory default.
3 After Service Port (A/S port)	This is for the repair purpose only that is not available for the user.

Bottom View of Installation Base



Inner View of Installation Base

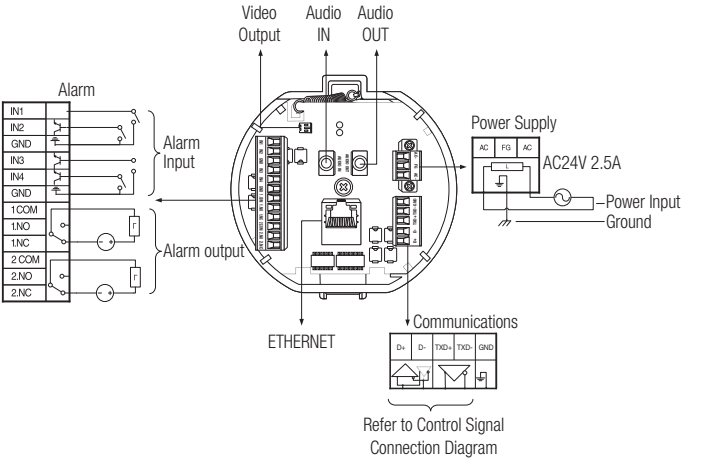


Item	Description
1 Alarm I/O Port	Used to connect the alarm I/O cable.
2 Video Out Port	Analog video output port. (for installation)
3 Audio Input Port	Used to connect the audio input cable.
4 Audio Output Port	Used to connect the audio output cable.
5 Power Port	Used to connect the power.

Item	Description
6 Communications Ports	Used for RS-485/422 communications.
7 ID Setup Switch	Specify the camera ID.
8 Communications Setup Switch	Set the transfer rate and protocols.
9 Network Connections	You can use a PoE+ or an Ethernet cable to connect this terminal to the network.

▪ Camera Wiring Interface Board

For the camera wiring, please refer to the picture below.

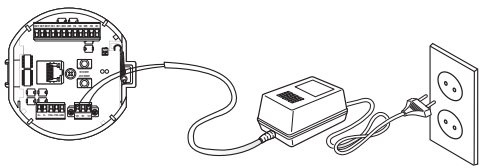


- Select Normal Open in the setup menu.
  - The sensor input is activated during a short for contact type, or when it is at "Low" level for the active type.
- Select Normal Close from the Setup menu.
  - The sensor input is activated when open for the contact type or when in high impedance state (open collector) for the active type.
- The maximum power capacity of the alarm outputs is DC +40V and 80 mA.
- When connecting alarm input and output cables, be sure to connect one cable to each terminal respectively.
- To connect products over the camera's capacity, please use an additional relay device.
- Connecting the power connector and GND incorrectly to the alarm out port may lead to fire and damage the camera.

CONNECTING WITH OTHER DEVICE

Preparing Adapter and Cable

- Connect the camera to the power adaptor. Then, plug the power cord of the adaptor to the wall outlet.



Check out the rated voltage and current before making connections.

Rated Power	Allowable Input Voltage	Current Consumption
AC 24V	AC 22V ~ 26V	2.5 A

- If applied with both PoE+ and AC 24V power supplies, the device is powered from the first engaged supply.
  - It is preferred to use single power supply of either one of PoE+ and AC 24V.
- If connected to a switch device that provides PoE+ power, you don't need to apply a power source of AC 24V supply.
- Make sure the PoE device suffices PoE+ (IEEE 802.3at) specifications.
  - If your device is connected to the switch with the standard of PoE (IEEE 802.3af), then go to the switch setup menu to "deactivate PoE".
    For further information on switch device, refer to the manufacturer's manual.
- If you use a PoE+ as a power, the boot time may vary depending on a switch model (by channel) or a maker (as PoE+ connection time is included.).

Electrical Resistance of Copper Wire at [20°C (68°F)]

Copper Wire Gauge (AWG)	#24(0.22mm²)	#22(0.33mm²)	#20(0.52mm²)	#18(0.83mm²)
Resistance (Ω/m)	0.078	0.050	0.030	0.018
Drop Voltage (V/m)	0.028	0.018	0.011	0.006
Recommended Distance (m)	Less than 20	Less than 30	Less than 30	Less than 30

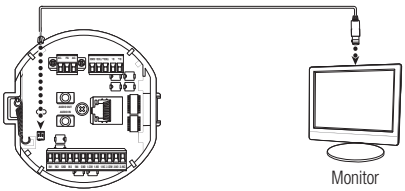
- As shown in the table above, you may encounter a voltage-sag depending on the wire length. If you use an excessively long wire for camera connection, the camera may not work properly.
  - Camera Operating Voltage: AC 24V±10%
  - Voltage drop measurements on the chart above may vary depending on the type and manufacture of the copper cable.

Ethernet Connection

Connect the Ethernet cable to the local network or to the Internet.

Connecting the installation monitor

Connect the cable to the camera's rear video output terminal and the installation monitor's video input terminal.



- The wiring varies depending on your monitor type and peripheral devices; please refer to the user manual for each device.
- Please make sure the monitor and camera are turned off when connecting them.

- This product is a network camera that transfers video over a network; the video output terminal is used to set the imaging range of the camera at installation.
- Using the terminal for monitoring purposes may cause problems such as degradation in video quality.
- It is not suitable for 24-hour monitoring using professional CRT monitors or TFT/LCD portable monitors.
- Use the network transfer screen for 24-hour monitoring and storage.

INSTALLATION

Preparing & Installing Camera Bracket

For installation guidelines for brackets and housings, refer to the installation manual that is enclosed with the bracket or housing.

- **Available Bracket Models**

Model	Item	SNP-6201	SNP-6201H
SHP-3701H	Outdoor Housing	Yes	-
SHP-3701F	Ceiling-mount Housing		
SBP-300HM3	Hanging Mount		
SBP-300WM1	Wall Mount		Yes
SBP-300WM			
SBP-300CM	Ceiling Mount		
SBP-300LM	Parapet Mount		
SBP-300KM	Corner Mount		
SBP-300PM	Pole Mount		

See "**Optional Accessories for Installation**" for the appearance of each bracket (unbundled). (page 31)

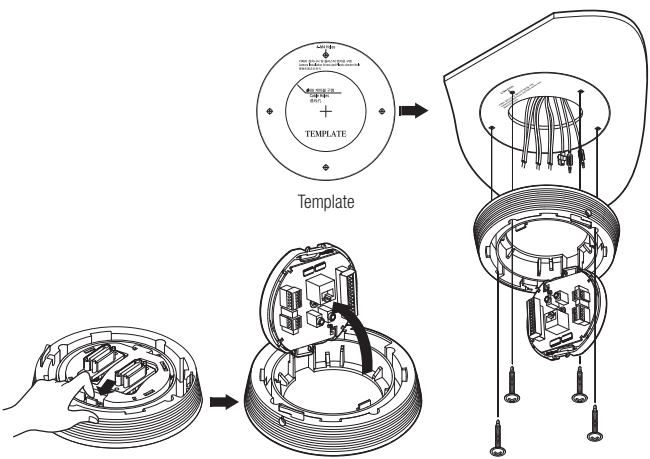
Installing by surface attachment

- SNP-6201H cannot be installed on the surface of a wall or ceiling.

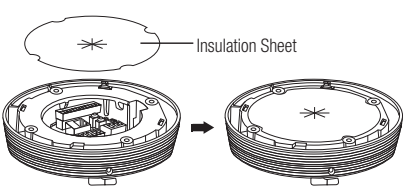
▪ Attaching Template & Installing installation base

1. Attach the provided template on the ceiling. Based on the template, drill a 86mm hole in the ceiling and arrange the wires through the hole.
2. Install installation base as shown.
3. Before installing the exposed bracket, open the hinged door at the bottom of the bracket as shown in the picture. Hold the knob on the hinged door to open it.

- In the case of installing the camera at highly humid place, install it on the ceiling after attaching the enclosed insulation sheet on the back of install base.



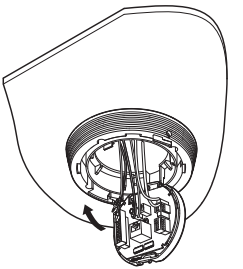
Template



<Attaching insulatioin sheet>

▪ Connect Terminal Wires

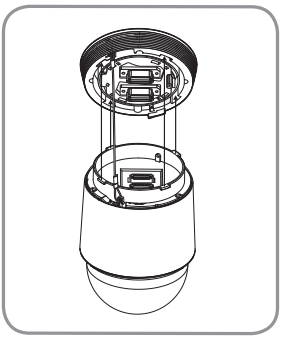
1. Connect the cables to the terminal block on the hinged door. Refer to "**Camera Wiring Interface Board**". (page 20)
2. Once the wiring is complete, close the hinged door.

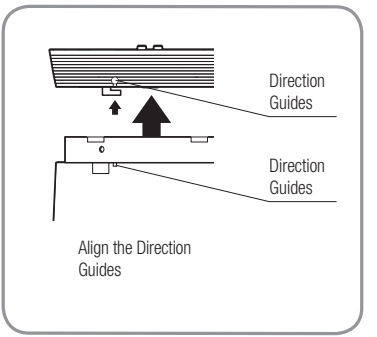


▪ Do not connect the camera to a power outlet until the installation is complete. Supplying power while the installation is in progress may cause fire or damage the product.

▪ Connecting Camera Safety Cable and Attaching Camera

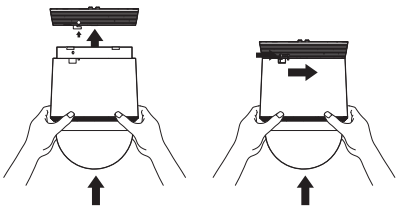
1. First, as shown in the left hand picture, pull out the safety cable from the base and then hook it to the mount. The safety cable is coiled inside the base.
   ▪ To attach the camera to the mount, refer to the alignment guide marks as shown in the picture.
2. Carefully attach the camera to the mount following the alignment guide marks as shown in the picture.





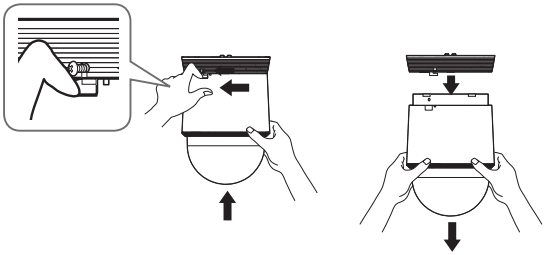
▪ Make sure to hook the camera's safety cable to the mount before proceeding. Otherwise you may be exposed to serious injury caused by the camera falling.

- To attach or detach the camera, refer to the picture.
  - Attaching the Camera : Push up the camera unit and rotate it clockwise until it cannot be rotated anymore, as shown in the figure. After rotation, fasten the screws assembled to the install base.



< To Attach the Camera >

  - Detaching the Camera : Unfasten the screws as shown in the figure, push in the hook, and rotate it counterclockwise.
    (The screws are not completely disassembled.)
    When the hook does not rotate any more, pull down the camera unit and separate it.

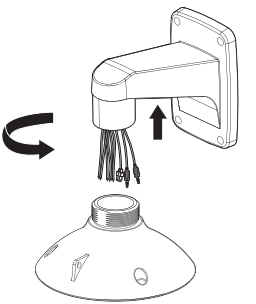


< To Detach the Camera >

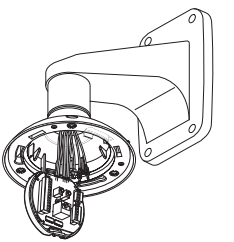
Installing by wall mount

- **Fix the installation base with the bracket**

1. Fix the base with the bracket by turning it clockwise.

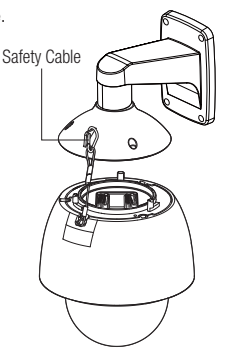


2. As shown in the picture below, gently press and lift up the handle of the hinged door on the bottom of the installation base. Please refer to the "**Camera Wiring Interface Board**" on page 20, connect the wires.

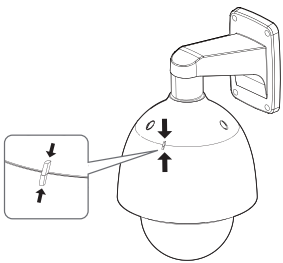


- Do not connect the camera to a power outlet until the installation is complete. Supplying power while the installation is in progress may cause fire or damage the product.

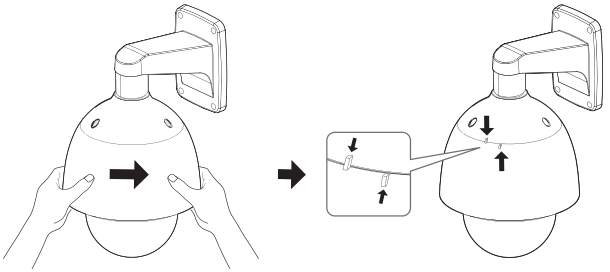
3. Connect the camera safety wire to the installation base.



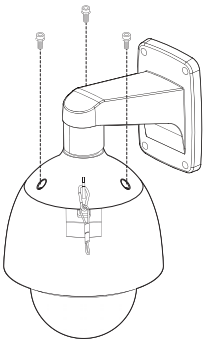
4. Assemble Camera and Installation Base
Assemble the installation base and camera by matching the installation direction guides.



5. Attach Camera
Rotate the mounted camera unit clockwise so that the reference indicators of top and bottom are as shown in the image on the right.



6. Secure Camera and Installation Base
As shown in the picture below, secure the installation base and camera using 3 hexagon screws.

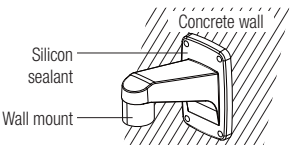


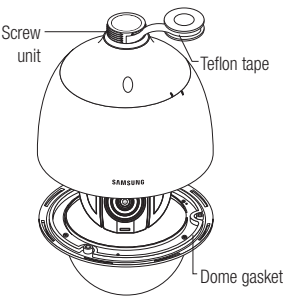
Notes for Waterproofing

This product is an indoor unit. If it is installed outdoors, use the outdoor housing to make it waterproof.

- **Installing the unit on the wall by combining the outdoor housing and wall mount**

1. Install the wall mount on the vertical wall. If the mount is installed on an inclined wall, moisture can penetrate inside the outdoor housing through the external cable.
2. Wrap the screw part of the housing with a sufficient amount of Teflon tape for assembly.
3. When separating the dome cover and fastening it to the housing frame, make sure that the gasket is not loosened to separate from the dome cover.
4. Install the wall mount adapter for waterproofing, and apply the silicon sealant between and around the wall and wall mount for sealing.



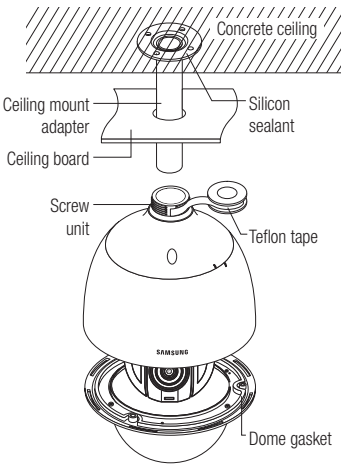


- Take particular caution to ensure that there is proper sealing if the installed side is not flat.

- **Installing on the wall by combining the outdoor housing and ceiling mount adapter**

1. Wrap the screw part of the housing with a sufficient amount of Teflon tape for assembly.
2. When separating the dome cover and fastening it to the housing frame, make sure that the gasket is not loosened to separate from the dome cover.
3. Install the ceiling mount adapter for waterproofing, and apply the silicon sealant between and around the wall and ceiling mount for sealing.

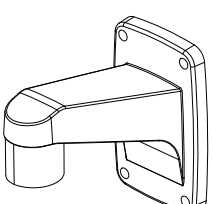
- Take particular caution to ensure that there is proper sealing if the installed side is not flat.



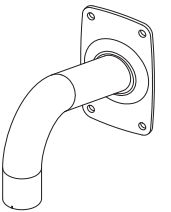
Optional Accessories for Installation

For your easier installation, you can purchase appropriate optional accessories available.

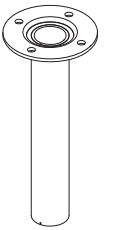
1. If installing the camera on the wall
   - Wall mount (SBP-300WM1)



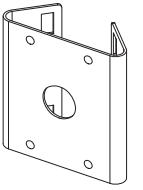
- Wall mount (SBP-300WM)



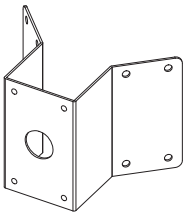
2. If installing the camera on the ceiling
   - Ceiling Mount (SBP-300CM)



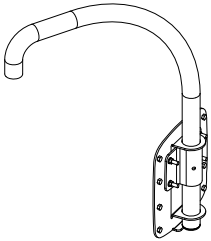
3. If installing the wall mount (SBP-300WM/SBP-300WM1) on an at least 80mm-long cylinder
   - Pole Mount (SBP-300PM)



4. If installing the wall mount (SBP-300WM/SBP-300WM1) on a corner of the wall
   - Corner Mount (SBP-300KM)



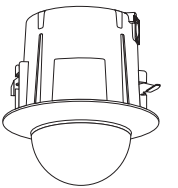
5. If installing on a building rooftop
   - Parapet Mount (SBP-300LM)



6. If installing SNP-6201 outdoors
   - Outdoor Housing (SHP-3701H)

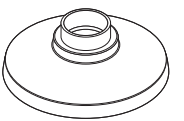
7. If installing SNP-6201 on a ceiling as built-in component

- Flush-Mount Indoor Housing for PTZ Dome Camera (SHP-3701F)



8. If installing SNP-6201 in the wall mount or ceiling mount

- Hanging Mount (SBP-300HM3)

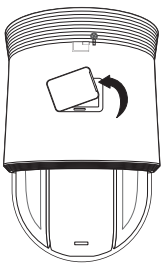


INSERTING/REMOVING A SD MEMORY CARD

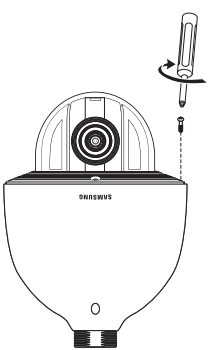
- Disconnect the power cable from the camera before inserting the SD memory card.

Inserting a SD Memory Card

1. Open the cover in the rear of the camera. (SNP-6201)

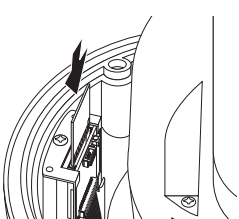


Using the screw driver, loosen 3 screws by turning them counterclockwise and separate the dome cover. (SNP-6201H)



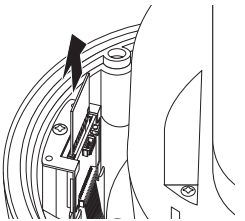
2. Push the SD memory card in the direction of the arrow shown in the diagram.

- Do not insert the SD memory card while it's upside down by force. Otherwise, it may damage the SD memory card.



Removing a SD Memory Card

Gently press down on the exposed end of the memory card as shown in the diagram to eject the memory card from the slot.



- Pressing too hard on the SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- To turn off the camera or remove the SD memory card, set the card to <**Off**> in <**Storage**> menu and press the [**Apply (** Apply **)**] button. (page 103)
- If you turn off the camera or remove the SD memory card that contains data from the product, the data may be lost or damaged.

MEMORY CARD INFORMATION (NOT INCLUDED)

What is a memory card?

The memory card is an external data storage device that has been developed to offer an entirely new way to record and share video, audio, and text data using digital devices.

Selecting a memory card that's suitable for you

Your camera supports SD/SDHC memory cards.
You may, however, experience compatibility issues depending on the model and make of the memory card.

For your camera, we recommend you use a memory card from the following manufacturers:
SD/SDHC Memory Card : Sandisk, Transcend

Memory cards of 4GB ~ 32GB is recommended for using with this camera.

Playback performance can be affected depending on the speed of memory card, so use the high-speed memory card.

It is recommended to use memory cards of at least class 6 speed.

Memory Card Use

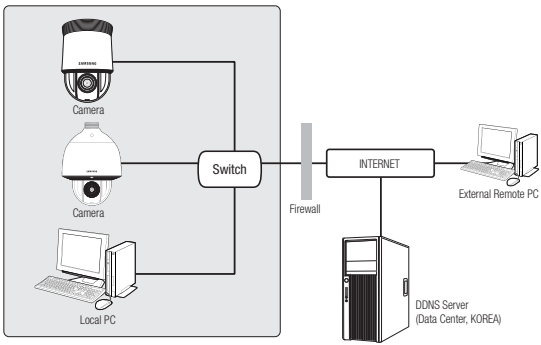
SD and SDHC memory cards feature a switch that disables writing data on to the media. Having this switch to the Lock position will prevent accidental deletion of data stored in the memory card but at the same time will also prevent you from writing data on to the media.

You can set up the network settings according to your network configurations.

CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

Connecting to the camera from a local PC in the LAN

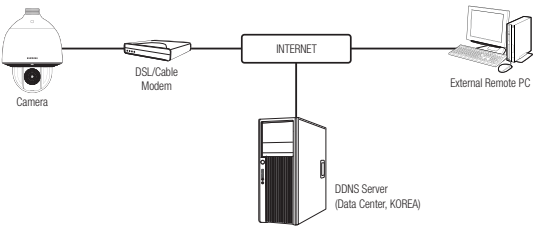
1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



<Local Network>

- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set. In this case, to resolve the problem, contact your network administrator.
- In the IP installer, you can use the initial password, "**4321**" to set IP Address, Subnet Mask, Gateway, HTTP Port, VNP Port, IP type. After changing the network interface, for better security, access the web viewer and change the password.
- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the IP Installer. For further details on IP Installer use, refer to "**Static IP Setup**". (Page 42)

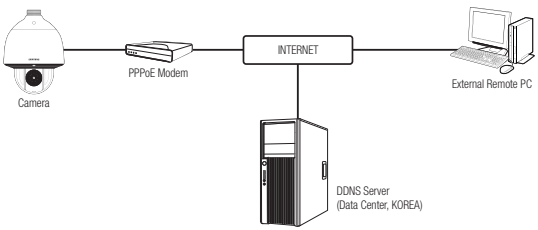
CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [**Setup**] page.
5. Move to [**Network**] – [**DDNS**] and configure the DDNS settings.
6. Move to [**Network**] – [**Interface**], and set the network type to [**DHCP**].
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 95)
- For configuring the DDNS settings, refer to "**DDNS**". (page 94)
- For setting the network type, refer to "**Interface**". (page 92)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM

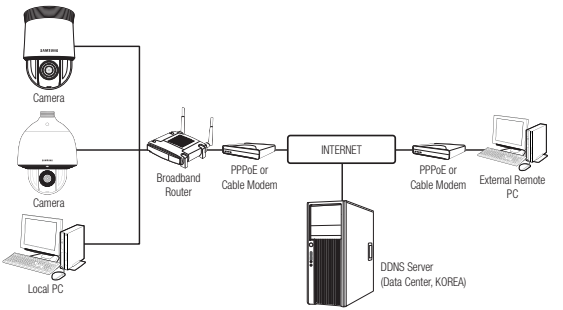


1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [**Setup**] page.
5. Move to [**Network**] – [**DDNS**] and configure the DDNS settings.
6. Move to [**Network**] - [**Interface**] Setup Page, set the network type to [**PPPoE**], and enter the ID and password.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 95)
- For configuring the DDNS settings, refer to "**DDNS**". (page 94)
- For setting the network type, refer to "**Interface**". (page 92)

CONNECTING THE CAMERA TO A BROADBAND ROUTER WITH THE PPPoE/CABLE MODEM

This is for a small network environment such as homes, SOHO and ordinary shops.



Configuring the network settings of the local PC connected to a Broadband Router

Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

- Select : <**Network**> → <**Properties**> → <**Local Area Connection**> → <**General**> → <**Properties**> → <**Internet Protocol (TCP/IP)**> → <**Properties**> → <**Obtain an IP address automatically**> or <**Use the following IP address**>.
- Follow the instructions below if you select <**Use the following IP address**>:

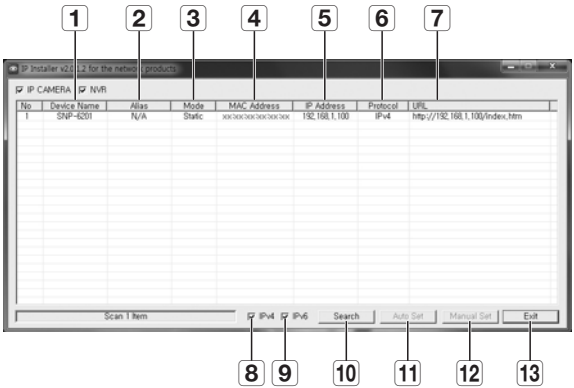
  ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1
  IP address : 192.168.1.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.1.1

  ex2) If the address (LAN IP) of the Broadband Router is 192.168.0.1
  IP address : 192.168.0.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.0.1

  ex3) If the address (LAN IP) of the Broadband Router is 192.168.xxx.1
  IP address : 192.168.xxx.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.xxx.1

- For the address of the Broadband Router, refer to the product's documentation.
- For more information about port forwarding of the broadband router, refer to "**Port Range Forward (Port Mapping) Setup**". (Page 47)

BUTTONS USED IN IP INSTALLER



Item	Description
1 **Device Name**	Model name of the connected camera. Click the column to sort the list by model name. However, search will be stopped if clicked during the search.
2 **Alias**	This function is not currently implemented.
3 **Mode**	Displays either <**Static**>, <**Dynamic**> or <**PPPoE**> for the current network connection status.
4 **MAC(Ethernet) Address**	Ethernet address for the connected camera. Click the column to sort the list by Ethernet address. However, search will be stopped if clicked during the search.
5 **IP Address**	IP address. Click the column to sort the list by IP address. However, search will be stopped if clicked during the search.
6 **Protocol**	Network setting for the camera. The factory default is “IPv4”. Cameras with the IPv6 setting will be displayed “IPv6”.

Item	Description
7 URL	DDNS URL address enabling access from the external Internet. However, this will be replaced with the <**IP Address**> of the camera if DDNS registration has failed.
8 IPv4	Scans for cameras with the IPv4 setting.
9 IPv6	Scans for cameras with the IPv6 setting. Activated in an IPv6 compliant environment only.
10 Search	Scans for cameras that are currently connected to the network. However, this button will be grayed out if neither IPv4 nor IPv6 is checked.
11 Auto Set	The IP Installer automatically configures the network settings.
12 Manual Set	You should configure the network settings manually.
13 Exit	Exits the IP Installer program.

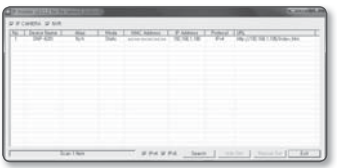
- For the IP installer, use only the installer version provided in the installation CD or use the latest one if available. You can download the latest version from the Samsung web site (www.samsungcctv.com).

STATIC IP SETUP

Manual Network Setup

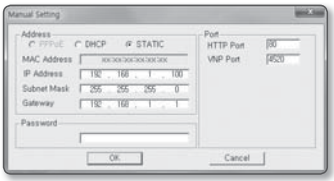
Run <**IP Installer_v2.XX.exe**> to display the camera search list.
At the initial startup, both [**Auto Set**] and [**Manual Set**] will be grayed out.

- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.



1. Select a camera in the search list.
   Check the MAC address of the camera on the camera's label.
   Both the [**Auto Set**] and [**Manual Set**] buttons will be activated.
2. Click [**Manual Set**].
   The Manual Setting dialog appears.
   The default values of <**IP Address**>, <**Subnet Mask**>, <**Gateway**>, <**HTTP Port**> and <**VNP Port**> of the camera will be displayed.

3. In the <**Address**> pane, provide the necessary information.
   - MAC (Ethernet) Address : The MAC address imprinted on the camera label is automatically displayed and requires no user setting.

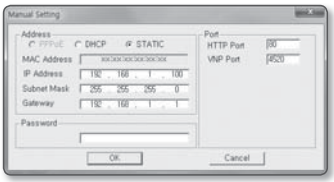


- You can configure the static IP settings only if the DHCP checkbox is unchecked.

If not using a Broadband Router

For setting <**IP Address**>, <**Subnet Mask**>, and <**Gateway**>, contact your network administrator.

4. In the <**Port**> pane, provide necessary information.
   - HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
   - VNP Port : Used to control the video signal transfer, defaulted to 4520.

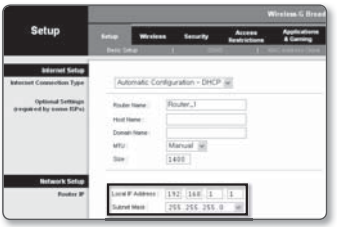


5. Enter the password.
   Enter the password of "**admin**" account, which was used to access the camera.

- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "**Administrator password change**" of the user setup. (page 121)

6. Click [**OK**].
   Manual network setup will be completed.

If using a Broadband Router



- IP Address : Enter an address falling in the IP range provided by the Broadband Router.
  ex) 192.168.1.2~254,
  192.168.0.2~254,
  192.168.XXX.2~254
- Subnet Mask : The <**Subnet Mask**> of the Broadband Router will be the <**Subnet Mask**> of the camera.
- Gateway : The <**Local IP Address**> of the Broadband Router will be the <**Gateway**> of the camera.

- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.
- For more information about port forwarding of the broadband router, refer to "**Port Range Forward (Port Mapping) Setup**". (Page 47)

If the Broadband Router has more than one camera connected

Configure the IP related settings and the Port related settings distinctly with each other.

ex)

Category		Camera #1	Camera #2
IP related settings	IP Address Subnet Mask Gateway	192.168.1.100 255.255.255.0 192.168.1.1	192.168.1.101 255.255.255.0 192.168.1.1
Port related settings	HTTP Port VNP Port	8080 4520	8081 4521

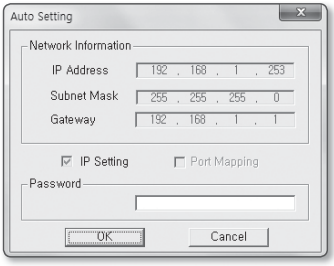
- If the <**HTTP Port**> is set other than 80, you must provide the <**Port**> number in the address bar of the Internet browser before you can access the camera.
  ex) http://IP address : HTTP Port
  http://192.168.1.100:8080

Auto Network Setup

Run <**IP Installer_v2.XX.exe**> to display the camera search list.
At the initial startup, both [**Auto Set**] and [**Manual Set**] will be grayed out.

- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

1. Select a camera in the search list.
   Check the MAC address of the camera on the camera's label.
   Both the [**Auto Set**] and [**Manual Set**] buttons will be activated.
2. Click [**Auto Set**].
   The Auto Setting dialog appears.
   The <**IP Address**>, <**Subnet Mask**>, and <**Gateway**> will be set automatically.
3. Enter the password.
   Enter the password of "**admin**" account, which was used to access the camera.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "**Administrator password change**" of the user setup. (page 121)

4. Click [**OK**].
   Auto network setup will be completed.

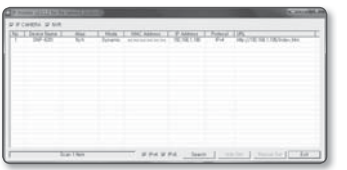
DYNAMIC IP SETUP

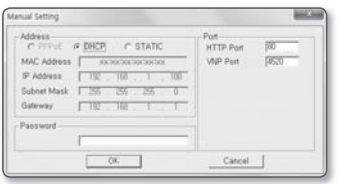
Dynamic IP Environment Setup

- Example of the Dynamic IP environment
  - If a Broadband Router, with cameras connected, is assigned an IP address by the DHCP server
  - If connecting the camera directly to modem using the DHCP protocols
  - If IPs are assigned by the internal DHCP server via the LAN

Checking the Dynamic IP

1. Run the IP Installer on the user's local computer.
   Cameras allocated with <**Dynamic IP**> address are shown in the list.
2. Select a camera from the search result.
3. Click the [**Manual Set**] button and check the camera's <**Dynamic IP**> address.
   If you uncheck <**DHCP**>, you can change IP to <**Static**>.





PORT RANGE FORWARD (PORT MAPPING) SETUP

If you have installed a Broadband Router with a camera connected, you must set the port range forwarding on the Broadband Router so that a remote PC can access the camera in it.

Manual Port Range Forwarding

1. From the Setup menu of the Broadband Router, select <**Applications & Gaming**> - <**Port Range Forward**>. For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.
2. Select <**TCP**> and <**UDP Port**> for each connected camera to the Broadband Router.
   Each port number for the Broadband Router should match that specified in <**Setup**> - <**Network**> - <**Port**> from the camera's web viewer menu.
3. When done, click [**Save Settings**]. Your settings will be saved.

- Above sample instructions are based on the CISCO's Broadband Router.
- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.

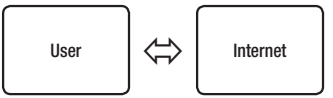
Setting up Port Range Forward for several network cameras

When several network cameras are connected to one Broadband Router device, you should forward the TCP 943 port of the router to the TCP 943 port of a connected camera.

- If you don't set properly the TCP 943 port of the router, you cannot get any video stream from the web page of the camera.

- TCP 943 port is a port for the Silverlight policy server of a camera.
- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- You cannot change the Silverlight policy server port of a camera.
- You can change the ports of the camera except the policy server port through its configuration web pages.

When Camera1 and Camera2 are connected to a router :



Broadband Router			
Start	End	Protocol	IP Address
943	943	TCP	192.168.1.100
3000	3000	TCP/UDP	192.168.1.100
3001	3001	TCP/UDP	192.168.1.101
4520	4520	TCP/UDP	192.168.1.100
4521	4521	TCP/UDP	192.168.1.101
8080	8080	TCP/UDP	192.168.1.100
8081	8081	TCP/UDP	192.168.1.101

Camera1 (192.168.1.100)	
HTTP Port	8080
Device port	4520
RTSP port	3000
Policy server port	943

Camera2 (192.168.1.101)	
HTTP Port	8081
Device port	4521
RTSP port	3001
Policy server port	943

CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

1. Run the IP Installer.
   It will scan for connected cameras and display them as a list.
2. Double-click a camera to access.
   The Internet browser starts and connects to the camera.

- Access to the camera can also be gained by typing the camera's IP address in the address bar of the Internet browser.

CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

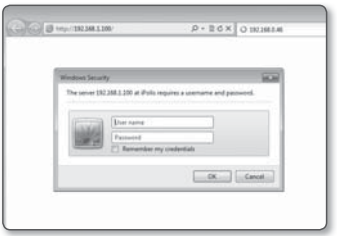
Since using the IP Installer on a remote computer that is not in the Broadband Router's network cluster is not allowed, users can access cameras within a Broadband Router's network by using the camera's DDNS URL.

1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.
   ex) http://www.samsungipolis.com/Product ID

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 95)

CONNECTING TO THE CAMERA

Normally, you would



1. Launch the Internet browser.
2. Type the IP address of the camera in the address bar.
   ex) • IP address (IPv4) : 192.168.1.100
   → http://192.168.1.100
   - the Login dialog should appear.
   • IP address (IPv6) : 2001:230:abcd:ffff:0000:0000:ffff:1111
   → http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - the Login dialog should appear.

If the HTTP port is other than 80

1. Launch the Internet browser.
2. Type the IP address and HTTP port number of the camera in the address bar.
   ex) IP address : 192.168.1.100:HTTP Port number(8080)
   → http://192.168.1.100:8080 - the Login dialog should appear.

Using URL

1. Launch the Internet browser.
2. Type the DDNS URL of the camera in the address bar.
   ex) URL address : http://www.samsungipolis.com/Product ID
   - the Login dialog should appear.

To check the DDNS address

If the camera is connected directly to the DHCP cable modem, DSL modem, or PPPoE modem, the IP address of your network will be changed each time you try to connect to the ISP (Internet Service Provider) server.
If this is the case, you will not be informed of the IP address changed by DDNS.

Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.
To register your device to the <**DDNS**> server, visit www.samsungipolis.com and register your device first, and then set the Web Viewer's <**Network**> - <**DDNS**> to <**Samsung DDNS**>, as well as providing <**Product ID**> that had been used for DDNS registration.

- You can use a DDNS connection only if you are connected to the external network.

PASSWORD SETTING

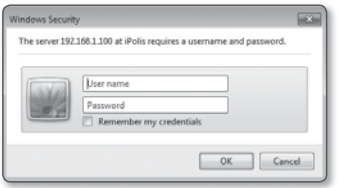
When you access the product for the first time, you must register the login password.
When the "**Password change**" window appears, enter the new password.

- A new password should be eight to fifteen letters long and a combination of at least two of uppercase/lowercase alphabets, numbers and special characters.
  - Special characters that are allowed. : ~`!@#$%^*()_-+=|{}[].?/
- You cannot use your ID as your password. You cannot repeat same letters more than twice and you cannot use the three consecutive keyboard buttons.
- If you lost your password, you can press the [**RESET**] button to initialize the product. So, don't lose your password by using a memo pad or memorizing it.

LOGIN

Whenever you access the camera, the login window appears.
Enter the User ID and password to access the camera.

1. Enter "**admin**" in the <**User name**> input box.
   The administrator ID, "**admin**", is fixed and can not be changed.
2. Enter the password in the <**Password**> input field.
3. Click [**OK**].
   If you have logged in successfully, you will the Live Viewer screen.



- When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.

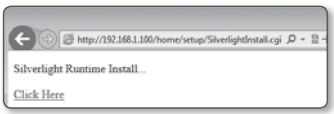
- If you check the "**Remember my credentials**" option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.

INSTALLING SILVERLIGHT RUNTIME

If your PC has not installed Silverlight Runtime or has just installed an old runtime version, you will be redirected to the Silverlight Runtime installation page automatically when accessing the web viewer.

To install on Windows OS

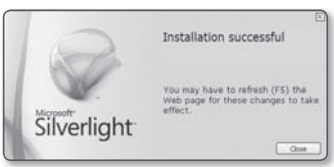
1. Click [**Click Here**].



2. When the file download dialog pops up, click [**Run**].

3. When the download is completed, click [**Yes**].
4. The Silverlight Runtime installation page will be displayed. [**Install now**] to proceed with the installation.

5. When done, click [**Close**].

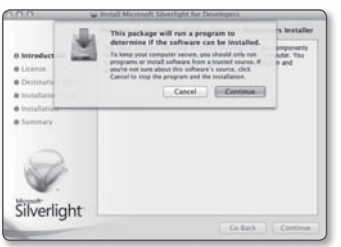


To install on MAC OS

1. Run the file trailing with ".dmg".

2. Run the install package file automatically created, ending with ".pkg".

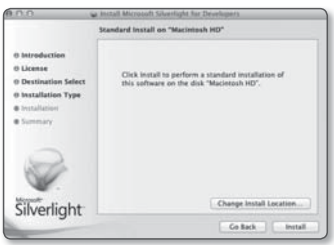
3. Click [**Continue**].



4. Select your language on the language selection screen, and click [**Continue**].

5. Click [**Agree**].

6. Click [**Install**].



7. Enter the password of the account currently logged in, and click [**Install Software**] and continue.

8. Once completed, click [**Close**].

INSTALLING STW WebViewer PLUGIN

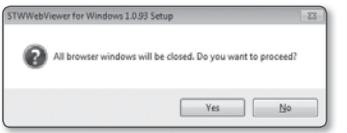
If connecting to a camera for the first time, you will see the installation message. Then, install the required WebViewer Plugin to access the camera and control the video from it in real time.

1. When the monitoring page is accessed for the very first time, the installation page is displayed. Click [**Click Here**] to begin installation.

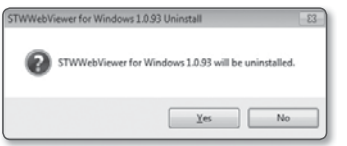
- If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

2. Click [**Run**] in the message window.

3. Click [**Yes**] when the notice window saying that all browser windows will be closed.

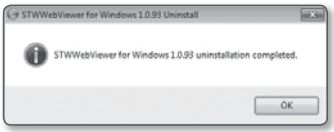


4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
Click [**Yes**] when the notice window is displayed.



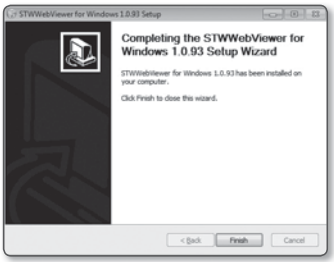
- Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.

5. Click [**OK**].
   The old version of Web Viewer Plug-in is deleted.



6. Click [**Install**] to begin installation of the Web Viewer Plug-in.

7. Click [**Finish**].
   STW Web Viewer Plug-in installation is completed.



- In your internet explorer, if you need to move to the installation screen after installing the STW webviewer plugin, check whether webviewer_activexplugin_lib.control in the "Tool → Additional Function Management" menu is "Activated". If not, and if there is a persisting problem, then select "Tools → Internet Options → General" and delete all the search records.

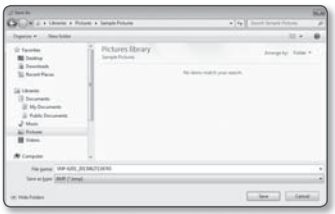
USING THE LIVE SCREEN

Item	Description
1 Monitoring	Move to the monitoring screen.
2 Playback	Switch to the monitoring screen that plays recording data in the SD memory.
3 Setup	Move to the Setup screen.
4 Viewer Screen	Displays the Live video on the screen. ■ You can use the mouse wheel to activate the digital zooming in Viewer screen.
5 Profile type	You can select a profile type in <**Video profile**> under the <**Video & Audio**> setup menu. ■ When the Web Viewer is connected, the profile information currently using is displayed.
6 Screen Optimization	The video size of the camera will switch to as big as the Web browser.
7 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 640x480. Press it again to switch back to the default resolution.

Item	Description
8 Full Screen	Switch the current video to the maximum size of the monitor.
9 Capture	Saves the snapshot as an image file in the .bmp or .jpg format.
10 Audio/Microphone Control	Enable Audio and Microphone are control the Audio volume. ■ Only the Audio volume can be controlled.
11 Alarm output	Activate the Alarm Out port.
12 PTZ	Control the pan/tilt/zoom operations of the camera.
13 Hide the context menu	The left-corner context menu will disappear but only the menu icon.

To capture the snapshot

1. Click [**Capture (** **)**] on the scene to capture.
   The Capture dialog should appear.
2. Confirm the save path and click [**Save**] button.
   The screenshot will be saved in the specified path.



■ If you encounter an interrupted video when capturing the image with IE8 on a Windows 7-based PC, deselect "**Turn On Protected Mode**" from "**Tools – Internet Options – Security**".

■ If the screen is not captured by IE browser in Windows 7 or 8, run the IE Browser with the Admin privilege.

To fit the full screen

1. Click the [**Full Screen (** **)**] button.
2. This will fit the Viewer to the full screen.
3. To exit the full screen mode, press [**Esc**] on the keyboard.

- For the Internet Explorer and Google Chrome browser, you can switch to the full screen.

To Use Audio

1. Click [**Audio (** **)**] icon to activate audio communication.
2. Use [ ] bar to control the volume.

- If there is no sound from pulling in and out the audio jack while it is in operation, click the [**Audio (** **)**] icon to enable it again.

To Use Microphone

Click [**Mic (** **)**] icon to activate the microphone.

To control the PTZ

1. Press the [**PTZ (** **)**] tab.
2. When the PTZ icon appears on the screen, use the direction buttons to adjust the camera angle, zoom factor or focus to your preference.

- For further details on PTZ use, refer to "**PTZ setup**". (page 86)

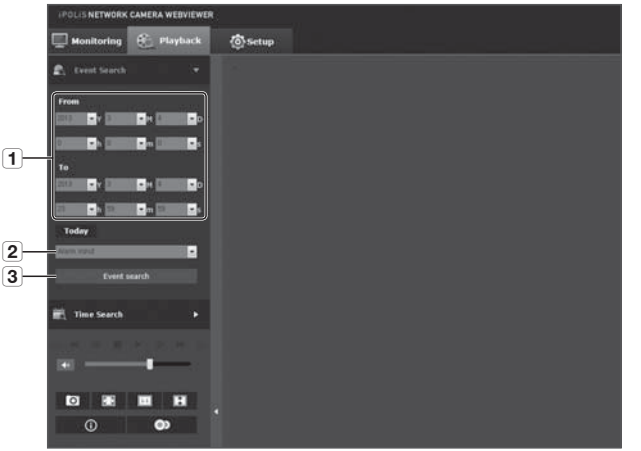
To enable the Area Zoom mode

- : Zoom the area selected with the mouse.
- : Change the current zoom factor to x1.
- : Return to the previous area and settings.
- : If navigated with Prev, it is switched to area and setting before navigation.
- Preset No. : Move to the preset position.

PLAYING THE RECORDED VIDEO

- Before you can play the video, you must configure the record settings. For details on record settings, refer to "**Storage**". (page 103)

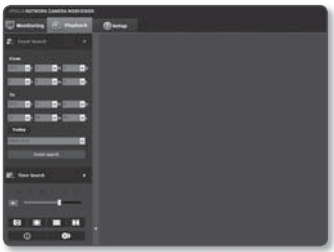
Name of event search screen and its function



Item	Description
1 **Search range setting**	Set the search date and time from the data saved in the SD memory card.
2 **Search event setting**	Set the event type to search within the search period.
3 **Event search**	Run the event search.

To play the content after searching by event

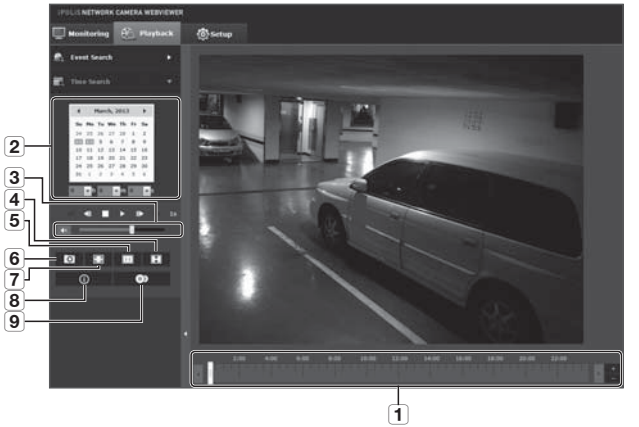
1. Click the [**Playback (** **)**] button.
2. Specify the start time and end time of your search.
3. Select an event type for your search within the specified period.
4. Click the [**Event search**] button.
   The search results will be displayed in the list.



- If more than 800 events are recorded within the search period, your search will be limited up to the date when the 800th event is recorded.
  For instance, if the search period is between 10th and 15th day of the month, and more than 800 events were recorded 10th through 11th, your search will be limited up to 11th day with a total of 800 events, and events after then (from 12th) will not be found.

5. Select a data item to play in the search list.
6. Click the [**Play (** **)**] button.
7. To stop playing the video, click [**Stop (** **)**].
8. To return to the search screen, click [**Exit (** **)**].

Name of time search screen and its function



Item	Description
1 Time bar	The section in the specific period is played by moving the time bar.
2 Search date setting	Set the search date using the calendar. ■ If there is data saved in your SD memory card on the day, it is marked as a box on the calendar.
3 Speaker	To listen to a voice signal (if present) in the recorded video, then activate the voice signal icon when you play it.
4 Screen optimization	The camera image is converted to fit the Web browser window.
5 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 800x600. Press it again to switch back to the default resolution.
6 Capture	The current image is saved as a .jpg or .bmp image file.
7 Full screen	The current image is converted to cover the maximum size of the monitor.

Item	Description
8 Video information	Time data of the replayed video is displayed on the screen.
9 Backup	Set the desired date to make a backup copy of video data saved in your SD memory card. ■ Can be set as up to 5 minutes.

To play after searching by time

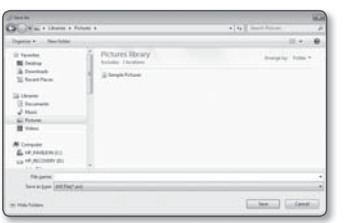
1. Click [**Time Search (**)].
2. Click a desired date in the calendar.
   The video on the specified date will be played.
3. If the video playback is stopped, select a time and click [**Play (**)].
   The video on the selected time will be played.
4. While the video is being played, the recording time for the current video will be shown.
5. Search for the video forward or backward, and control the play speed.
   - How to Control the Play Interval
     ▮▶ : Select this button to move 1 frame forward.
     ◀▮ : Select this button to move 1 second back.
   - To control the play speed
     If selecting ▶▶, the button will switch to x1, x2, x4, x8, and the play speed will increase accordingly.
     When the ◀◀ button is selected, the playing speed is decreased to -1x, -2x, -4x, -8x and the playing speed slows down gradually. Subsequently the quick playing speed is returned to the normal speed and the reverse playing speed increases.
   - To control the playback direction
     If you see the ▶▶ button with the play speed displayed, the video will be played forward; Whereas, if you see the ◀◀ button with the play speed displayed, the video will be played backward.
   - How to set the time bar
     If you press the + button, the details of the time bar section can be viewed.
     If you press the − button, you can view a wider range of times and the desired time can be selected more easily.

6. Move [**Time bar ( )**] to a desired time point of the video before playing it.
   The time containing a normal recoding file will be highlighted in blue; the time with the event recording will be highlighted in red.

To back up the searched video

1. During playback, click [ ] on the scene to back up.
   The scheduling window for backup start and end time appears.

2. Click [ ] button.
   The Save As window appears.
3. Confirm the save path and click [**Save**] button.
   The screenshot will be backed up to the specified path.



To play the backup video

The backed up images are saved in an .avi format. Gom Player, VLC Player, and Window Media Player are recommended as the media player compatible with this format.

- In case of Windows Media Player, download the latest codec from www.windows7codecs.com and install it prior to use.

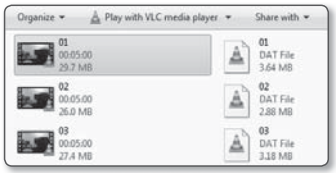
To Play an AVI File

- If you used the AVI codec to record your video, you can insert a memory card in the PC to check the video.
  If you used STW codec to record your video you need to go to [**Playback**] and make an AVI backup file, so that you can play the AVI video file.
  For more on how to set the type of video recording file, please refer to <**Storage**>. (page 103)

1. Separate the SD memory card from the camera.

- Before separating the SD memory card, set the <**Device**> to <**Off**> in the "**Setup → Event → Storage**" menu.

2. Insert the SD memory card into the PC.
3. Play the AVI file in the "**\ch00\img\YYYY_MM_DD**" directory, using a media player.



- The file name begins with "01.avi" and the file number increments by 1.
- Once corrupted, the data in the SD memory card cannot be replayed in the Web Viewer's [**Playback**].

SETUP

You can configure the video & audio, network, event and system settings of the camera in the network.

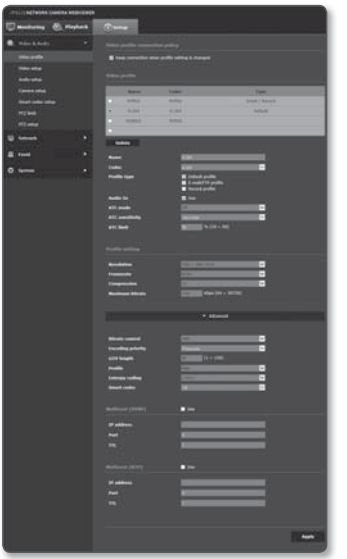
1. In the Live screen, click [**Setup (** Setup **)**].
2. The Setup screen appears.

- Microsoft Silverlight 5.0 or higher is required to be installed on the PC for setup pages that provide preview video.
  If not installed already, automatically moves to the Silverlight setup.

VIDEO & AUDIO SETUP

Video profile

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Video profile**>.
3. Set the <**Video profile connection policy**>.
   - Keep connection when profile setting is changed : Changing profile properties that is used by existing connection does not affect such connection and remains with old profile setup.
     If not selected, changing a profile used by an existing connection resets such connection.



4. Select each profile properties.
   For more details, refer to "**To Add/Change the Video Profile**". (Page 71)
5. Click the input box of each item and enter / select a desired value.
   - The context menu may differ depending on the selected codec type.
   - Default profile : If no profile is selected when using the Web Viewer, the default video profile is applied.
   - E-mail/FTP profile : Video profile to be transferred to the specified email or FTP site.
     - Only the MJPEG codec can be set as the E-mail/FTP profile.
   - Record profile : This is the profile that is applied to video recording.
   - Audio-In : Sets whether to use audio for video recordings.
6. According to your situation, set ATC (Auto Transmit Control) mode.
   - ATC mode : It adjusts the video properties according to the variance in the network bandwidth, controlling the bit rate. Adjusting the bit rate depends on the ATC mode.

     - Control framerate : Reduce the frame rate if the network bandwidth drops down.
     - Control compression : Control the compression rate if the network bandwidth drops down.
       Compression adjustment can cause deterioration of the image quality.
   - If <**Bitrate control**> is set to <**CBR**>, the encoding priority according to the ATC mode will be fixed as below:

Bitrate control / ATC mode	Control framerate	Control compression
CBR	Framerate	Compression

- ATC sensitivity : Affect the transfer rate according to the variance in the network bandwidth.
  The transfer rate will be adjusted to the fastest if the bandwidth is <**Very high**>, and adjusted to the latest if the bandwidth is <**Very low**>.
- ATC limit : If the quality or frame rate is adjusted, the property will be changed to the applied value (%) against the previous setting value (100%).
  Note that if you reduce the property value too much, you may encounter flickering on the screen. So it is advisable to adjust the value within the threshold.

- It is recommended to apply ATC control only for cameras supporting ATC.
- Set the ATC sensitivity to <**Very low**> in a network environment with high variance in the network bandwidth.
- If the network connection is unstable, you may encounter flickering on the screen.

7. When done, click [**Apply (** Apply **)**].

- MJPEG, H264 is the default profile and you cannot delete it or change the name and codec.

To Add/Change the Video Profile

The profile setup can be added or modified to accommodate various profiles depending on the recording conditions.

1. Select one from the <**Video profile**> options.
2. Provide the name and select a codec.
3. Specify the conditions under which the codec will be applied.
4. Specify the details of the selected codec including resolution and frame rate. Click <**Advanced**> to display the context menu.
   - Resolution : Set the video size of the H.264 and MJPEG files.
   - Framerate : Set the max number of video frames per sec.

- The <**Sensor**> mode setup in Camera Setup changes the maximum configurable framerate.

Sensor	25 fps	30 fps
Framerate	1~25 fps	1~30 fps

- Compression : Specify the compression rate of the video.
- Maximum bitrate : Set the max bit rate of video when the bit rate control is set to VBR.

- As the bit rate can be adjusted limitedly according to the resolution, frame rate and screen complexity, the actual bit rate can be greater than the maximum bit rate. So you must consider the use conditions when setting the value.
- In the case of multiple connections, the maximum/target total beat rate to receive the video/audio signal stably is 20Mbps.
  For example, if 10 users are connected, the maximum/target beat rate must be set to 2Mbps(2048kbps) or less.

- Target bitrate : Set the target bit rate when the bit rate control is set to CBR.
- Bitrate control : You can select one from constant bit rate and variable bit rate for compression. Fixed bitrate means that the network transmission bitrate is fixed while varying the video quality or frame rate, variable bitrate means that a higher priority is placed on the video quality while varying the bitrate.

- After setting the fixed bit rate for bit control, if you select the video quality priority mode, depending on the complexity of the screen, the actual transmitted frame rate may differ from the frame rate setup in order to guarantee the optimal video quality for the given bit rate.

- Encoding priority : You can set the priority of video transmission to frame rate or compression.
- GOV length : It specifies the distance (in terms of number of frames) between two consecutive I-Frames in a video sequence when H.264 codec was selected. (One I-Frame + 0~Several P-Frames)
- Profile : You can select the H.264 profiling method.
- Entropy coding : Reduce the possible compression loss due to encoding.
- Smart codec : Specify the use of Smart codec.

▪ The Smart Codec will be active only if the codec is of H.264 and the compression system is CBR.

- Multicast(SVNP) : Specify the use of the SVNP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : Set the TTL for the SVNP packet.
- Multicast(RTP) : Specify the use of the RTP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : You can set the TTL for the RTP packet.

▪ If you set the Multicast address to 224.0.0.0~224.0.0.255, multicast may not work properly in all environments. In that case, we recommend you change the multicast address.

What is GOV length?

GOV(Group of Video object planes) is a set of video frames for H.264 compression, indicating a collection of frames from the initial I-Frame (key frame) to the next I-Frame. GOV consists of 2 kinds of frames: I-Frame and P-Frame.

I-Frame is the basic frame for the compression, also known as Key Frame, which contains one complete image data. P-Frame contains only the data that has changed from the preceding I-Frame.

For H.264 codec, you can determine the GOV length. (1~150)

Video setup

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Video setup**>.
3. Select a <**Video source**> mode.
   - Flip/Mirror mode : Displays the video from the camera upside down or reversely.
   - Digital Flip : This limits the vertical screen navigation range of the camera lens.
4. Specify the privacy zone.
5. When done, click [**Apply (** Apply **)**].

To set the privacy zone

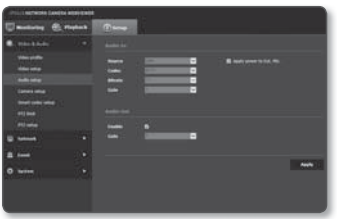
You can specify a certain area of the camera video to be protected for your privacy.

1. Set it to <**On**>.
2. Select the color masking of desired privacy area.
3. When done, click [**Apply (** Apply **)**].
4. Place the cursor at a point in the video and drag it to whatever you need.
5. Provide a name and press [**OK**].
6. If you want to delete a name in the list, select it and click [**Delete (** Delete **)**].

- Privacy can be set only if DIS is deactivated and zoom is less than x20.
- If the privacy area is smaller than the minimum size, no area will be drawn.

Audio setup

You can configure the I/O settings of the audio source from the camera.



1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Audio setup**>.
3. Set the audio input value.
   - Source : Sets the audio input.
     - Line : Connect the cable to the audio device.
     - External microphone : 3.5 pi(¢) jack type external MIC.
   - Apply power to Ext. Mic. : If the external microphone connected has no separate power supply, check this option to set camera to supply power to the connected external microphone. The option is enabled if <**External microphone**> is selected.
   - Codec : Specify the audio codec.
     - G.711 : A audio codec standard, it uses 64 Kbps PCM (Pulse Code Modulation) encoding.
       ITU standard audio codec that is adequate for digital voice transfer in PSTN network or through a PBX.
     - G.726 : ITU standard audio codec applying ADPCM (Adaptive Differential Pulse Code Modulation) for variable bit rates of 40/32/24/16 Kbps to 64 Kbps PCM encoding.
   - Bitrate : Set the bit rate to differentiate compression ratio if using G.726 codec.
   - Gain : Specify the audio input amplification.
4. Set the audio output level.
   - Enable : Sets whether to use audio output.
   - Gain : Set the amplification value for the audio output.
5. When done, click [**Apply (** **Apply** **)**].

Camera setup

You can change the camera settings according to the environment where the camera is located.

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Camera setup**>.
3. Configure the settings as necessary of : Sensor, SSDR, White balance, Backlight, Exposure, Special, Focus, OSD, Time OSD
4. When done, click [**Apply (** **)**].

- If a certain time (timeout: 240s) is elapsed with your not pressing the [**Apply (** **)**] button after changing the settings, your changes will not be applied.

To Set the Sensor

It specifies how many frames the camera CMOS sensor will capture per second.

1. Select <**Sensor**>.
2. Select <**Sensor mode**>.

- Refer to "**Video profile**" for the framerate setup range of the <**Video profile**> according to mode setup. (Page 68)

SSDR (Samsung Super Dynamic Range) Setup

In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.

1. Select <**SSDR**>.
2. Set <**Mode**> to <**On**>.
3. Configure the <**Level**> setting as necessary.
   - Level : Adjust the level of the dynamic range.

White balance Setup

You can correct the image colors based on white under any lighting conditions.

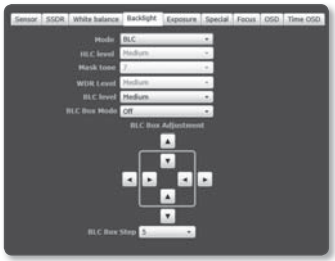
1. Select <**White balance**>.
2. Select <**Mode**>.
   - ATW : Corrects the colors of the camera video automatically.
   - Manual : You can adjust the red and blue gains of the camera video manually.
   - AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode.
     To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the [**AWC Set**] button. If the lighting environment is changed, you should readjust the settings accordingly.
   - Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
   - Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.

- In AWC mode, click the [**AWC Set**] button if you want to keep the white balance level of the current image.

- The white balancing may not work properly in the following conditions:
  If this is the case, switch to AWC mode.
  - If the surrounding condition of the object is out of the temperature correction range
    ex) Clear sky, sunset
  - If the surrounding of the object is dark
  - If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

BLC Setup

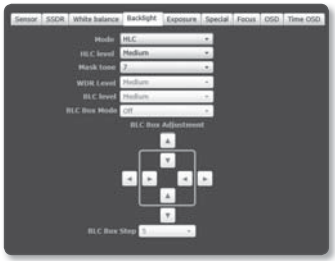
You can specify a desired area on the video manually and set the area to be displayed more clearly.



1. Select <**Backlight**>.
2. Set <**Mode**> to <**BLC**>.
3. Select each item and set it properly.
   - BLC level : You can change the level to adjust the brightness of the monitoring area.
   - BLC Box Mode : Specify the mode of BLC Box.
   - BLC Box Adjustment : Use the arrow buttons to adjust the size and position of the BLC Box.
   - BLC Box Step : Specify the pixel unit for movement. You can use the arrow buttons of <**BLC Box Adjustment**> to add or reduce the pixels.

HLC (Highlight Compensation) Setup

If a strong light like a streetlamp or vehicle headlight points toward the camera, the area can be set to be cut off to prevent a saturated area on the monitor.



1. Select <**Backlight**>.
2. Set <**Mode**> to <**HLC**>.
3. Select each item and set it properly.
   - HLC level : This adjusts the brightness level to cut off the highlighted area.
   - Mask tone : This adjusts the brightness of the cut-off area.
     - As the number increases, the color is set to change from dark to white.

- At night operation, this function will be activated only if the incoming highlight exceeds a certain area in a low contrast environment.
- At night operation, HLC will not function in too a bright or too a dark scene.

WDR Setup

You can set to display a sharp image of the objects in a scene where both bright and dark areas exist.

1. Select <**Backlight**>.
2. Set <**Mode**> to <**WDR**>.
3. Select each item and set it properly.
   - WDR Level : Specify the WDR sensitivity level.

- If WDR mode is active, the shutter mode cannot be changed. Data transfer via the network is available at up to 15 fps.
- If the WDR mode is active, a moving object can cause an afterimage on the screen.

Ex)

<WDR OFF>

<WDR ON>

- If you select WDR, you may encounter the following problems. So set it to Not Used.
  - Unnatural change of colors that cause an unnatural image on the screen
  - Noise on the bright area of the image
- As the performance of the WDR function may differ depending on the bright-area size of the image, it is recommended to optimize the installation angle for the best performance.
- At night operation, this function will be activated only if the incoming highlight exceeds a certain area in a low contrast environment.
- Increasing the maximum value may cause an unnatural portion of the image.

- For the best WDR performance, it is recommended to set the Iris mode to <**Auto**>.
- Since the auto focus operation can be repeated depending on the lighting condition if user backlight compensation is used, it is recommended to use the focusing mode of <**One Shot AF**> or <**Manual**>.
- Shutter cannot be used in WDR mode.

Exposure Setup

You can adjust the exposure level of the camera.

1. Select <**Exposure**>.

2. Select each item and set it properly.

- Brightness : Adjust the screen brightness.
- Shutter mode : Adjust the electronic shutter of the camera.
  - ESC (Electronic shutter control) : Adjust the shutter speed automatically according to the ambient brightness.
  - Manual : Adjust the shutter speed of the camera manually.
  - A.FLK (Anti flicker) : Select this feature if you encounter a flickering screen due to a frequency mismatch with the ambient lighting.
    - Sens-up can be used only when the shutter type is <**ESC**>, and cannot be used when it is <**Manual**> or <**A.FLK**>. But Sens-up can be used regardless of shutter type when WDR mode is used. (apart from the influence of AGC)
    - The shutter cannot be used if the backlight compensation is set to WDR mode.
- Shutter speed : Control the shutter speed manually.
- SSNR3 : Specify the use of noise reduction.
  - SSNR3 mode cannot be used if the AGC mode is set to <**Off**>.
- Sens-up mode : Automatically senses the darkness level at night or in a low contrast scene and extends the accumulation time accordingly for a bright and sharp image.
  - Sens-up can be used only when the shutter type is <**ESC**>.
  - Sens-up mode cannot be used if the AGC mode is set to <**Off**> or <**Manual**>.
  - The greater the video accumulation factor is, the brighter the screen is but the afterimage of a moving object grows accordingly and the Auto Focus mode may not operate properly.

- Sens-up limit : Set the work condition to Auto mode in a low contrast scene.
- Iris : You can set the camera iris to Auto or Manual to your preference.
  - Auto : Automatically sets the iris adaptively to the ambient lighting and shutter speed.
  - Manual : Iris F-No is set manually.
- Iris F-No : If the iris mode is set to Manual, specify the F number of the iris.
  - As F-No increases, the iris decreases, so the screen is darkened, and as F-No decreases, the screen is brightened.
- AGC mode : Select AGC Control mode.
  Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.
  - SSNR, Sens-up and <**Auto**> mode in daytime/nighttime mode setting cannot be used if the AGC mode is set to <**Off**>.
  - Sens-up and <**Auto**> mode in daytime/nighttime mode setting cannot be used if the AGC mode is set to <**Manual**>.
- AGC Val : If the AGC mode is set to Manual, specify one between 0dB and 36dB.

Special Setup

1. Select <**Special**>.
2. Select each item and set it properly.

- DIS : Automatically compensates for the flicker on the screen.
  - DIS cannot be used if VA/MD and tempering detection are used.
  - Digital zoom cannot be used if DIS is used.
- Day & night : You can switch the mode to adjust the black and white level as well as the colors.
  - Color : Always displays the video in colors.
  - B/W : Always displays the video in black and white.
  - Auto : Displays in color mode during normal daytime and switches to black and white mode in a low contrast scene at night.
    - Auto daytime/nighttime mode setting cannot be selected if the AGC mode in the <**Exposure**> menu is set to <**Off**> or <**Manual**>.
- Dwell time : This is the time while each applicable lighting condition is kept in order to enable the switch between day and night modes.
- Duration : Specify the time interval of lighting at which the sequence operation is triggered.
- Sharpness mode : Adjust the overall sharpness of the image.
  If selecting <**On**>, you can adjust the sharpness of the image.
- Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
- Color level : Adjust the color level of the image.

Focus Setup

1. Select <**Focus**>.
2. Select each item and set it properly.
   - Mode
     - Manual : The focus will be adjusted manually according to the zoom factor.
     - Auto : The focus will be adjusted automatically according to the zoom factor.
     - One Shot AF : Auto Focus will be performed once after the zooming operation.
   - Digital zoom : Specify the use of digital zoom.
     - Digital zoom cannot be used if DIS is used.
   - Digital zoom limit : Specify the limit of the digital zoom.
   - Zoom tracking : Specify the focus sync mode with the panning/tilting/zooming operation.
     - Off : Only the zoom lens will work.
     - Auto-Track : It will control (detect and correct) the zooming operation to keep fitting the focus.
     - Tracking : The zooming operation will be guided by the focus track.
   - Zoom speed : Adjust the zoom tracking speed.
   - Init. lens : Reset the lens to prevent the step-out in zoom mode.
   - Duration : Specify the frequency of resetting the lens.
     - You can specify the date of resetting the lens that will perform in auto focus mode. Specify the time between 1 and 7 days, and the resetting will be performed at 24-hour interval starting from the specified date.

OSD Setup

1. Select <**OSD**>.
2. Select each item and set it properly.
   - Camera title : Specify whether or not to display the camera title on the screen.
     - You can enter up to 15 characters for the title.

   - Camera title position X, Y : Specify the coordinates where the camera title is displayed on the screen.
   - PTZ position display : Set the PTZ location on the screen.
   - Preset name display : Specify whether or not to display preset name on the screen.
   - Camera ID : Specify whether or not to display the camera ID number on the screen.

Time OSD Setup

1. Select <**Time OSD**>.
2. Select each item and set it properly.
   - Time display : Specify the use of time display on the screen.
   - Time position display X, Y : Specify the position of time display on the screen.

   - Date format : Specify the date format that will be displayed on the screen.
   - Display weekday : Specify the use of date display date on the screen.

Smart codec setup

Set a desired area of the video incoming from the camera as ROI area and specify the detection sensitivity for the area.

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Smart codec setup**>.
3. Select ROI Area.
   - Face detection : Active if a face is recognized on the monitoring screen.

     ▪ Face detection is enabled only if the following conditions are met:
     - The face is positioned at ±45 degrees to the left or right from the top.
     - The effective range of the face rotation is ±30 degrees vertically, and ±60 degrees horizontally.
     - The minimum size of the face is 20x20 based on the resolution of 320x240.
   - Manual : Specify the ROI area to monitor manually.
4. Select a quality for the ROI area.
   The ROI area will be displayed in the specified quality.
5. If you set the area of interest by <**Face detection**> select <**Face detection sensitivity**>.
   ▪ As the sensitivity grows, face detection becomes more close and detailed.
6. If you set the area of interest by <**Manual**>, then select the desired area with your mouse and drag it.
   ▪ You can specify up to 5 distinct areas.
7. To cancel all the settings for the area, click the [**Clear (** Clear **)**] button.
8. When done, click [**Apply (** Apply **)**].

▪ The Smart codec will not be active if it is set to <**Off**> in <**Video profile**>. (page 68)

PTZ limit

You can specify restrictions on the pan or tilt function.

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**PTZ limit**>.
3. Decide if you want to limit the PT operations. If so, specify the details.
   - Mode : Select a mode to set between Pan limit and Tilt limit.
   - Use : Select whether to use limit in set mode.
   - Tilt Range : The tilt limiting range is selected.
   - Action : PT limiting operation is set.
     - [Start] : Start limit setting.
     - [Enter] : Provide the start and end points.
     - [Exit] : If you want to change the point setting, click this to return to the input dialog.

PTZ setup

You can change the direction of lens and activate the zoom.

1. Select the <**Video & Audio (** **)**> tab from Setup menu.
2. Click <**PTZ setup**>.
3. Adjust the direction.
   - [**Change direction to (** **)/(** **)/(** **)/(** **)/(** **)/(** **)/(** **)/(** **)**] : The camera direction is adjusted.
   - [**Moving speed control (** **)**] : The bigger the number is, the faster the moving speed becomes.
4. Set the zoom and focus.
   - [**Zoom In (** **)**] : Zooms in the screen.
   - [**Zoom Out (** **)**] : Zooms out the screen.
   - [**Adjust Focus (** **/** **)**] : Adjusts the focus in the screen.
   - [**Auto Focus (** **AF** **)**] : Automatically adjust the screen focus.
   - [**Zoom Speed Control (** **)**] : Move the bar to the right to speed up zooming.
5. Set the preset.
6. Set the start position (Home position) on the screen.

To add a preset

1. Select the preset number to add.
2. Set the name for the preset.
3. Press the [+] button.

To delete a preset

1. Select the preset number to delete.
2. Press the [−] button.

To move to a desired preset

1. Select a preset number that you want to move.
2. Press the [→] button.

To configure the detailed settings for the preset

1. Select the number of preset that you want to configure.
2. Press [⚙] to enter the preset editing mode.
   - Preset No. : Display the number of the selected preset.

   - Preset edit : You can change the camera settings according to the selected preset.
     For more information about the preset editing, refer to "**Camera Setup**". (page 75)
   - Special : In <**After action**>, you are able to set whether auto execution is activated or not after executing the preset.
     If the function is deactivated or no auto execution is activated, the preset execution is maintained.

   - Video analysis : Analyze the video of the selected preset.
     For details about the video analysis, refer to "**Motion detection / Video analytics**". (page 109)

3. When done, click [**Apply (** ✓ **)**].
4. Press [↩] to return to the PTZ setup screen.

- After saving the preset, make sure to close preset editing mode by clicking [↩] button or "Back" button of the browser. If you change the settings of other camera while the window is still open, this may cause an error.

To set the home position

1. Move to a desired start screen point and press [💾].
   The point will be set to the home position.
2. Click [➔] in the home position. You will move to the predetermined home position.

To configure the swing settings

Swing is a monitoring function that moves between two preset points and enables you to trace the motion.

1. Select the <**Swing setup**>.
   The menu screen will switch to the swing setting screen.
2. Select a swing setting mode.
   - Pan swing : You can set the swing monitoring using the PAN function.
   - Tilt swing : You can set the swing monitoring using the Tilt function.
   - Pan & Tilt swing : You can set the swing monitoring only using both PAN and Tilt functions.
3. Set <**First preset**> and <**Second preset**> to specify a swing range.

> ▪ When moving to the second preset from the first preset, the camera will move to the right direction on the screen.
> If you set <**Flip/Mirror mode**> to <**On**> in the video setup, it will move in the opposite direction. (Page 73)

4. Set the moving speed and dwell time.
5. Press the [Set] button.
   The first preset, second preset, speed and dwell time will be saved in set mode.
6. Press the [Start] button.
   It performs the swing operation.
7. Press the [Stop] button.
   The running swing will be stop.

> ▪ If you want to set the swing, then you need at least two presets set already.

To set a group

The group function enables you to group various presets before calling them in sequence. Six groups can save a total of 128 presets each.

1. Select the <**Group setup**>.
   The menu screen will switch to the group setting screen.
2. Select a group setting mode.
   - Group No. : Select a group number.
   - Preset No. : Select a preset number.
   - Speed : Specify the speed of movement.
   - Dwell time : Specify the duration for which an operation is kept at the preset position.
3. Press the [**Add**] button.
   Entered in the bottom list.
4. If you want to delete a preset added, select it and press the [**Delete**] button.
5. Press the [**Set**] button.
   Saved in the bottom list.
6. Press the [**Start**] button.
   It performs the group operation.
7. Press the [**Stop**] button.
   The running group will be stop.
8. Press the [**Remove**] button.
   Selected group data will be deleted.

To configure the tour settings

The tour function enables you to call groups of your presets in sequence.

1. Select the <**Tour setup**>.
   The menu screen will switch to the tour setting screen.
2. Configure the tour settings in detail.
   - Group No. : Select a group number.
   - Dwell time : Specify a waiting time before a new group is called.
3. Press the [**Add**] button.
   Entered in the bottom list.
4. Press the [**Set**] button.
   Saved in the bottom list.
5. Press the [**Start**] button.
   It performs the tour operation.
6. Press the [**Stop**] button.
   The running tour will be stop.
7. Press the [**Remove**] button.
   Selected tour data will be deleted.

To set the tracing function

Tracking remembers the trace of movements instructed using the direction button and reproduces it for your reference.

1. Select the <**Trace & Auto Run**>.
   The menu screen will switch to the PTZ tracking and Auto operation menu screen.
2. Select a tracking number.
   The operation will be saved with display of the memory usage. The saving time differs, depending on the level of the PTZ operation.
   If memory is filled to 100% or the recording end configuration is not completed in 2 minutes from the beginning of saving, it will be automatically terminated.

3. Press the [Set] button.
   Selected tracing number will be saved.
4. Move the navigation path of saving using the pan/tilt/zoom.
5. Press the [Stop] button.
   Saving is terminated.
6. Press the [Start] button.
   Selected tracing number will be activated as set.

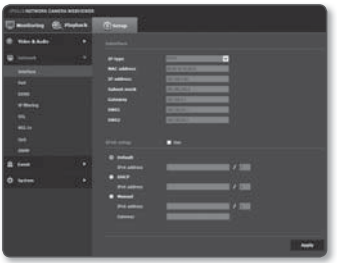
To set the auto run

This feature will activate the predefined sequence function if the user does not manipulate anything on the product for a certain time.

1. Select the <**Trace & Auto Run**>.
2. The menu screen will switch to the PTZ tracking and Auto execution menu screen.
3. Select an auto run mode.
   - Home : It is moved to the home position.
   - Preset : It is moved to the selected preset number.
     - Auto run of preset can be set in "**Special-After action**" of preset edit. (page 87)
   - Swing : Automatically executes the operation in Swing mode.
   - Group : Automatically executes the operation in Group mode.
   - Tour : Automatically executes the operation in Tour mode.
   - Trace : Automatically executes the operation in Trace mode.
   - Auto pan : Automatically executes the 360° rotation in the pan direction.
4. Press the [Set] button.
   Selected operation will be performed automatically.

NETWORK SETUP

Interface



1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**Interface**>.
3. Set the <**Interface**> and <**IPv6 setup**> as necessary.
   - IP type : Select an IP connection type.
     - Manual : Specify the IP address, Subnet mask, Gateway, DNS1, and DNS2.
     - DHCP : Specify the DNS1 and DNS2.
     - PPPoE : Specify the DNS1, DNS2, ID and Password.
     - If you set it to <**Manual**>, you should specify the IP, Subnet mask, Gateway, DNS 1 & 2 manually.
   - MAC address : Shows the MAC address.
   - IP address : Displays the current IP address.
   - Subnet mask : Displays the <**Subnet mask**> for the set IP.
   - Gateway : Displays the <**Gateway**> for the set IP.
   - DNS1/DNS2 : Displays the DNS(Domain Name Service) server address.
4. Set the <**IPv6 setup**>.
   - Set to <**Use**> to use IPv6 address.
   - Default : Use the default IPv6 address.
   - DHCP : Display and use the IPv6 address obtained from the DHCP server.
   - Manual : Enter IP address and gateway manually and use it.
5. When done, click [**Apply (** **Apply** **)**].

- The IP addressing system will be defaulted to DHCP. If no DHCP server is found, the previous settings will be restored automatically.
- Once completed with editing, click [**Apply (** **Apply** **)**] to apply changes and the browser exits. After a while, connect again with the changed IP.

Port

1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**Port**>.
3. Type in each item in the Port menu as necessary.
   - Neither the port range between 0 and 1023 nor port 3702 is available.
   - HTTP port : HTTP port used to access the camera via the web browser. The default is 80(TCP).
     - Setting the HTTP port for Safari and Google Chrome browsers to 65535 is not allowed by security policy.
   - HTTPS port : In this version, the security of the web communication protocol HTTP is strengthened. It can be used when you set HTTPS mode in SSL. The initial value is set to 443(TCP).
     - The available setting range is 1024~65535. (For security reasons, in your Safari or Google Chrome browser, you may not use 65535 as your HTTPS port.)
   - Device port : Set a port used to transfer video signals with the Samsung protocols.
   - RTSP port : Used to transfer videos in the RTSP mode; the default is 554.
   - Web streaming port : Used to transfer videos to the Web Viewer; the default is 4520.
   - Silverlight policy port : Silverlight is used to permit to acquire a network connection; the default is 943.

- If changed the HTTP port, the browser exits.
  Afterwards, address should contain the newly assigned HTTP port trailing the IP.
  ex) IP address: 192.168.1.100, HTTP port : Assigned 8080 → http://192.168.1.100:8080
  (If HTTP port is set to 80, no need to specify the port number)
- The port range of the Web Streaming is between 4502 and 4534. If the Device port is with this effective range, the Web Streaming port should be specified the same as the Device port.
- You cannot change the Web Streaming/Silverlight policy server port of a camera.

4. When done, click [**Apply (** **)**].

DDNS

DDNS is an abbreviation of Dynamic Domain Name Service that converts the IP address of a camera into a general Host Name so that the user can easily remember it.

- You can use the DDNS service only if the internet is connected.

1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**DDNS**>.
3. Select the <**DDNS**> connection type.
4. Type in the DDNS items according to the selected type.
   - Samsung DDNS : Select this if you use the DDNS server provided by Samsung Techwin.
     - Product ID : Enter the product ID that is registered with the Samsung DDNS service.
     - Quick connect : It sets port forwarding automatically when used with a UPnP (Universal Plug and Play) supporting router.
   - Public DDNS : Select one of provided public DDNS servers when you use a public DDNS server.
     - Service : Select desired public DDNS service server.
     - Host name : Enter the name of the host that is registered with the DDNS server.
     - User name : Enter the user name for the DDNS service.
     - Password : Enter the password for the DDNS service.
5. When done, click [**Apply (** **Apply** **)**].

- If selected <**Quick connect**>, be sure to select Samsung DDNS service.

Registering with DDNS

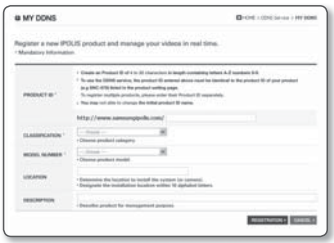
To register your product with the Samsung DDNS

1. Visit the iPOLiS web site (www.samsungipolis.com) and sign in with a registered account.

2. From the top menu bar, select <**DDNS SERVICE**> - <**MY DDNS**>.

3. Click [**PRODUCT REGISTRATION**].
4. Enter the product ID.
   - You must perform the duplicate check for the ID that you entered.

5. Select a <**CLASSIFICATION**> and specify the <**MODEL NUMBER**>.
6. Specify the product location with a description if necessary.
7. Click [**REGISTRATION**].
   The product will be added to the product list that you can check.



To connect to the Samsung DDNS in camera setup

1. From the DDNS setup page, set <**DDNS**> to <**Samsung DDNS**>.
2. Provide the <**Product ID**> that you registered product ID with the DDNS site.
3. Click [**Apply (** Apply **)**].
   When the connection is successfully made, you will see the message of <**(Success)**> on the screen.

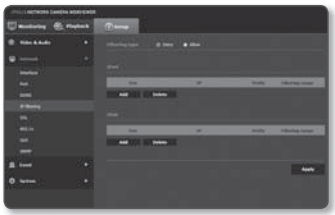
Configuring public DDNS in Camera Settings

1. Open the DDNS settings page and select <**Public DDNS**> for <**DDNS**>.
2. Enter the corresponding site's host name, user name and password.
3. Click [**Apply (** Apply **)**] button.
   If the connection properly establishes, <**(Success)**> appears.
4. When done, click [**Apply (** Apply **)**].

- To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.
  For port forwarding setup, refer to "**Port Range Forward (Port Mapping) Setup**". (page 47)

IP filtering

You can create a list of IPs that you want to grant or deny access to them.



1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**IP filtering**>.
3. Select <**Filtering type**>.
   - Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
   - Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.
4. Click the [**Add (** **)**] button.
   The IP list will be created.
5. Provide the IP that you want to grant or deny access from.
   When you enter an IP address and a Prefix, the list of IP addresses available will appear in the right-side filter range column.

- If selected <**Allow**> for IP Filtering and <**IPv6 setup**> of <**Interface**> is set to <**Use**>, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to <**Deny**>, it should be added to <**Allow**>.
- Only the IP addresses that are set to <**Use**> will be displayed in the filter column.

6. Select an IP to delete from the list.
   Click the [**Delete (** **)**] button.
7. When done, click [**Apply (** **)**].

SSL

You can select a secure connection system or install the public certificate for this purpose.

1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**SSL**>.
3. Select a secure connection system.
   - To access the camera using HTTPS mode, you have to type the IP address for the camera in the form of "https://<Camera_IP>".
     If you failed to configure the Web viewer settings in HTTPS mode with Internet Explorer, edit the Internet options as follows: <Menu → Tools → Internet Options → Advanced → Security → Uncheck TLS 1.0, and check TLS 1.1, TLS 1.2>
4. Search for the public certificate that you want to install on the camera.
   To install the certificate on the camera, you need to provide a certificate name (it can be arbitrarily assigned by the user), certificate file issued from the certification authority and a key file.
   - The <**HTTPS (Secure connection mode using the public certificate)**> item will be active only if there exists a public certificate installed.
5. When done, click [**Apply (** Apply **)**].

Installing the certificate

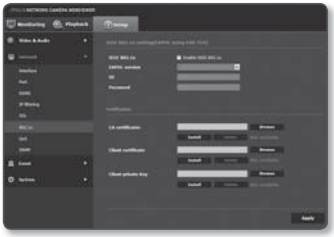
1. Enter the certificate name.
2. Click the [**Browse (** Browse **)**] button, select the public certificate file and key file to be installed, and then click the [**Install (** Install **)**] button.

Deleting the certificate

1. Click [**Delete (** Delete **)**] button.
2. To delete a public certificate, you should access the network video decoder in the mode of <**HTTP (Do not use secure connection)**> or <**HTTPS (Secure connection mode using a unique certificate)**>.

802.1x

When connecting network, you can choose whether using 802.1x protocol, and then install the certification.



1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**802.1x**>.
3. Set the <**IEEE 802.1x setting(EAPOL using EAP-TLS)**>.
   - Enable IEEE 802.1x : Specify the use of the 802.1x protocol.
   - EAPOL version : Select version 1 or 2.
   - ID : Enter the client certificate ID.
   - Password : Enter the client private key password. If the key file used is not encrypted, you don't need to enter it.

> ■ If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.

4. Install/remove the certificate.
   - CA certificates : Select a public certificate that contains the public key.
   - Client certificate : Select a public certificate that contains the client certificate key.
   - Client private key : Select a public certificate that contains the client private key.
5. When done, click [**Apply (** Apply **)**].

To install/remove 802.1x related certificates

1. Press the [**Browse (** Browse **)**] button for each item and select a certificate to install.
2. If no certificate is installed, you will see "Not Available" appearing next to the selected item.
3. Press the [**Install (** Install **)**] button to start installation with a message of "Installed" next to the item.
4. Press the [**Delete (** Delete **)**] button to remove the certificate.

QoS

You can specify the priority to secure a stable transfer rate for a specific IP.

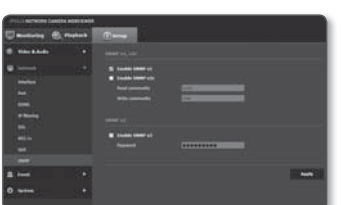
1. From the Setup menu, select the <**Network ( )**> tab.
2. Click <**QoS**>.
3. Click the [**Add (** Add **)**] button. The IP list will be created.
4. Enter an IP address to which you will apply QoS.

- The default prefix for IPv4 is 32; For DSCP, the default is set to 63.
- Only the IP addresses that are set to <**Use**> can be prioritized.

5. Select an IP to delete from the list. Click the [**Delete (** Delete **)**] button.
6. When done, click [**Apply (** Apply **)**].

SNMP

With the SNMP protocols, the system or network admin can monitor the network devices on a remote site, and configure the environment settings.



1. From the Setup menu, select the <**Network ( )**> tab.
2. Click <**SNMP**>.
3. Specify the <**SNMP**>.
   - Enable SNMP v1 : SNMP version 1 will be active.
   - Enable SNMP v2c : SNMP version 2 will be active.
     - Read community : Provide the name of the read community where you can access to the SNMP information. The default name is <**public**>.
     - Write community : Provide the name of the write community where you can access to the SNMP information. The default name is <**write**>.

- Enable SNMP v3 : SNMP version 3 will be active.
  - Password : Specify the default password for SNMP version 3. The default password is <**admin4321**>.
    - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
      Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
    - Password should be longer than 8 characters, no more than 16 characters.

4. When done, click [**Apply (** Apply **)**].

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
  Refer to "**SSL**". (page 98)

EVENT SETUP

FTP / E-mail

You can configure the FTP/E-mail server settings so that you can transfer the images taken with camera to your PC if an event occurs.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**FTP / E-mail**>.
3. Select <**FTP configuration**> or <**E-mail configuration**> and enter / select a desired value.
   - FTP configuration
     - Server address : Enter the IP address of the FTP server that you transfer the alarm or event images to.
     - ID : Enter the user ID with which you will log in to the FTP server.
     - Password : Enter the user account password for logging into the FTP server.
     - Upload directory : Specify the FTP path where you will transfer the alarm or event images.

- Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
- Passive mode : Select <**On**> if you need to connect in passive mode due to the firewall or the FTP server settings.

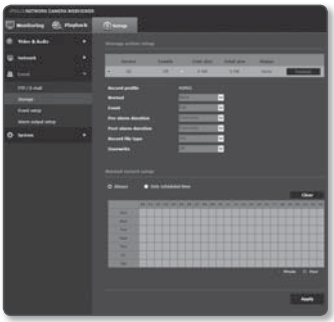
• E-mail configuration
- Server address : Enter the IP address of the email server that you transfer the alarm or event images to.
- Use authentication : Select whether to use authorization.
- Use SSL : Specify the use of SSL.
- ID : Enter the user ID for logging into the email server.
- Password : Enter the user account password for logging into the email server.
- Port : The default port of the email server is 25; however, you can use a different port number according to the email server settings.
- Recipient : Enter the address of the email recipient.
- Sender : Enter the address of the email sender. If the sender address is incorrect, the email from the sender may be classified as SPAM by the email server and thus may not be sent.
- Subject : Enter a subject for your email.
- Body : Provide the text for the massage. Attach the alarm or event images to the email that you are preparing.

4. When done, click [**Apply (** **)**].

Storage

You can set the record conditions or the use of recording for the SD memory, check the size of stored data, or format the SD memory itself.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Storage**>.



To make recording on the SD memory

1. Check the memory card's <**Free size**> and <**Total size**>.
2. If there are sufficient free space, set the device to <**On**>.
   Otherwise, check the stored data and if you find them not important, then click <**Format**> to format the SD memory.
   - If your SD memory card writes slowly, only one frame per second will be stored.
   - For a SD memory card with a large capacity, the formatting will be slowed down accordingly.
   - Setting to higher options of resolution, bit rate and frame rate increases the amount of data produced. As the size of data grows, transferred video can be stored only at 1 fps even if you set the record quality to full frames.
   - As some space of the SD memory card is reserved for the system, only about 90% of the total capacity is available for use.
3. Specify the storage action.
   - Record profile : Shows recording profile's codec type.
   - Normal : This sets the option to always record the content regardless of the event.
     - I-Frame : Records one image per second.
     - Full : Records at the frame rate set in the record profile.
   - Event : Set the recording type for a certain event that occurs.
     - <**Event**> recordings are not saved as <**Normal**>.

- Pre-alarm duration : Specify the time point before the occurrence of the alarm; starting from the time point, the images will be transferred. You can specify up to 5 seconds before the occurrence of the alarm.
- Post-alarm duration : Specify the time point after the occurrence of the alarm; to the specified time point, the images will be transferred. You can specify up to 120 seconds after the occurrence of the alarm.
- Record file type : It specifies the file format of the recorded images.
  - STW : It is Samsung Techwin's unique file format.
  - AVI : It is the conventional avi format.
- Overwrite : If the SD memory is full, this will delete old data and store new data in replacement.

4. Specify the <**Normal record setup**>.
   - Always : Always save recorded video in the SD memory card.
     - If set to Always, the activation time cannot be changed.
   - Only scheduled time : Records only on the specified time of the specified day of week.
   - [Clear (Clear)] : The specified time is released.
5. When done, click [**Apply (** Apply **)**].

Alarm input 1~4

You can set the alarm input type, activation time, and operation mode.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Event setup**>.
3. Select <**Alarm input**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Specify an input device.
   - Type
     - Normal open : It is normally open, but if it is closed, an alarm will be triggered.
     - Normal close : It is normally closed, but if it is open, an alarm will be triggered.
6. Specify the <**Activation time**>.
   - Always : Always check if an alarm occurs. It activates in operated mode when the alarm occurs.
     - If set to <**Always**>, the activation time cannot be changed.
   - Only scheduled time : Check if an alarm occurs at a specified day of the week for a specified time period. It activates in operated mode when the alarm occurs.
   - [Clear (Clear)] : Reset all settings.
   - Minute : Click an area in Activation Time and set the time by minutes.
   - Hour : Drag your mouse at Activation Time and set the time by hours.

- The transfer interval setting value must be smaller than the preset activation interval to succeed in image transmission.

7. Specify an operation that will perform if an alarm occurs.
   - FTP : Specify the use of FTP transfer in the alarm input setup.
     - Refer to "**FTP / E-mail**" for more details. (page 101)
   - E-mail : Specify the use of email transfer in the alarm input setup.
     - Refer to "**FTP / E-mail**" for more details. (page 101)
   - Record : Specify the use of recording in the alarm input setup.
     - Set <**Record**> to <**On**> in <**Storage**>. (page 103)
   - Alarm output1/Alarm output2 : Select whether to set the alarm output if an alarm is incoming, and specify the alarm output time.
   - Goto preset : Moves to the specified preset location when setting the alarm input.
8. When done, click [**Apply (** Apply **)**].

Time schedule

You can set to save the video data at a certain interval as scheduled regardless of the actual occurrence of the event.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Event setup**>.
3. Select <**Time schedule**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Specify the <**Transfer interval**>.
6. Specify the <**Activation time**>.
   - Always : Always activates in operated mode at the set interval.
   - Only scheduled time : Periodically activates in operated mode at a specified time and date.
7. Specify the activation conditions.
   - FTP : Specify the use of the FTP transfer if an event occurs.
     - Refer to "**FTP / E-mail**" for more details. (page 101)
8. When done, click [**Apply (** Apply **)**].

Tampering

You can set to detect tampering attempts and trigger events, such as sudden change of camera's framing direction, blocked lens and other overall change of scenes from the video.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Event setup**>.
3. Select <**Tampering**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.

   - DIS cannot be used if tampering detection is used.

5. Set the tampering detection sensitivity. The higher the sensitivity, detects the minutest tampering attempts.
6. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 105)
7. When done, click [**Apply (** **)**].

- The default tampering detection function may not work properly in the following cases:
  - Under circumstances of simple background or low illumination and night time may lower the detection sensitivity.
  - A severe shaking of the camera or a drastic change to the illumination can be considered a tampering by mistake.
  - Detection of the tampering may take some time (maximum 5 seconds) right after the tampering was made.
  - Once a tampering is detected, the camera will resume a normal operating after a certain stability time (approx. 5 seconds) during which no detection will be performed.

Motion detection / Video analytics

Events of motion detection and video analysis can be set to trigger event signal output.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Event setup** >.
3. Select <**Motion detection / Video analytics**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.

   - DIS cannot be used if Motion detection/ Video analytics is used.

5. According to your purpose, select from motion detection and intelligent video analysis.
6. Set <**Sensitivity**>, <**Size**> and <**Area**>. When selected Intelligent Video Analysis, set <**Analytics**> too.
7. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 105)
8. When done, click [**Apply (** Apply **)**].

- Motion detection and Video analytics cannot be used simultaneously.
- Before using, set the minimum and maximum motion sizes to suit desired motion range to be detected.
- Detected size of an object may have difference with the actual size according to its shape.
- Up to 16 objects from the top side of the screen can be displayed.
- If camera is capturing a close object, the video analysis capability may degrade.
- In the following cases, motion detection and intelligent video analysis function may be degraded or cause improper detection.
  - The object color or brightness is similar to the background.
  - Small activities around the border area of the camera's field of view.
  - Multiple movements continue occurring at random due to a scene change, rapid lighting changes or other reasons.
  - A fixed object continues moving in the same position.
  - Motions of less position changing such as approaching to the camera or fading away from the camera.
  - Moving object approaches to the camera too close
  - An object hides other objects behind.
  - Two or more objects overlap or one object divides in multiple portions.
  - Too fast object (for a proper detection, one object should be found overlapping between contiguous frames).
  - Reflection / blur / shadow due to a strong light such as direct sunlight, illumination, or headlamp.
  - In severe snow, rain, wind or in dawn / dusk.

To use Motion detection

It detects a motion that meets all conditions specified by sensitivity, size and area.

1. Select a motion detection mode.
2. Select <**Sensitivity**> tab to set the sensitivity level. You can set the sensor's sensitivity to detect a motion out of the background from the monitoring video.

- In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

3. Select <**Size**> tab.
   You can limit the minimum/maximum size of motion to be detected.
   - Minimum Size : To set the minimum size of detected motions, select <**Minimum Size**> and then point and drag to the desired size on the screen using the mouse.
   - Maximum Size : To set the maximum size of detected motions, select <**Maximum Size**> and then point and drag to the desired size on the screen with your mouse.

- Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments.
  Note that same motions on the same location can be differently detected in their detection size; it is recommended to consider and include the tolerable difference when setting the minimum/maximum detection sizes.

4. Select <**Area**> tab.
   Use your mouse to drag to specify preferred area as the motion detection area.
   - Detection area : Detects objects movement in the area set by a user.
5. To delete an area, right click on the screen to open popup context menu and select Delete, and [**OK**] button.

> ■ All areas defined are deleted.

6. When done, click [**Apply (** Apply **)**].

To use Video analytics

It detects event that meets all conditions specified by sensitivity and size and the event condition rules.

1. Select the video analysis mode.
2. Set <**Sensitivity**> and <**Size**>.
   For further details on settings, refer to "**To use Motion detection**". (Page 111~112)
3. Select <**Analytics**> tab.
4. Select the video analysis type.
   - Passing : Detects an object passing the area set by a user.
   - Entering/Exiting : Detects an object entering or exiting the area set by a user.
   - Appearing (Disappearing) : Detects an object appearing or disappearing in the area set by a user.
5. Set the video analysis rules.
   For further details on settings, refer to "**To set the video analysis rules**". (page 114~115)
6. Set whether to use <**Analytics rule overlay**>.
   Specified rules of virtual lines and areas are displayed on the monitoring page.
7. Enable or disable <**Detection result overlay**>.
   The location and size of detected motions will be marked by rectangles.
8. When done, click [**Apply (** Apply **)**].

To set the video analysis rules

- **Passing**

1. Set the type to <**Passing**>.
2. On the screen, click on preferred starting and ending point of the virtual line, then a popup window appears.
3. Select the desired rule:
   - Right: Detects motions of moving from the left to the right, over the virtual line.
   - Left: Detects motions of moving from the right to the left, over the virtual line.
4. Click [**OK**].
5. To remove a defined rule, right click on the displayed virtual line to open popup context menu and select [**Delete**] button.

- **Entering/Exiting**

1. Set the type to <**Entering/Exiting**>.
2. On the screen, click four vertices to define detection area and a popup window appears.
3. Select the desired rule:
   - Entering : Detects motions of moving object whose center point entering into the defined area, from outside of the area.
   - Exiting : Detects motions of moving object whose center point exiting from the defined area, from inside of the area to outside.
4. Click [**OK**].
5. To remove a defined rule, right click on the displayed side lines of the area to open popup context menu and select [**Delete**] button.

▪ **Appearing (Disappearing)**

1. Set the analysis type to <**Appearing (Disappearing)**>.
   - Appearing(Disappearing) : It detects event of appearing object that appears in the area and remaining for a certain time period while not passing through the area borders, and opposite case of disappearing of objects existed in the area.
2. Drag the desired location of the image. The dragged grey area will be set as an area of interest.
3. If you want to remove the existing rule, then right click with your mouse and click on the Delete [**OK**] button.

Face detection

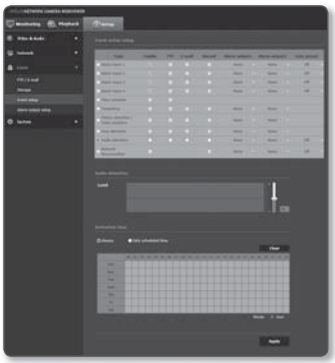
You can set to detect recognized face and trigger an event accordingly.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Event setup**>.
3. Select <**Face detection**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Select <**Sensitivity**> tab to set the sensitivity level.
   - As the sensitivity grows, face detection becomes more close and detailed.
6. Select <**Area**> tab and drag on the screen to define the desired detection area. You can specify up to 4 detection areas.
7. If you want to remove all the existing areas, then right click with your mouse and click on the Delete [**OK**] button.
8. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 105)
9. When done, click [**Apply (** Apply **)**].

Audio detection

You can set to detect sound over the specified level and trigger an event accordingly.

1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Event setup**>.
3. Select <**Audio detection**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Set the audio detection's sound level. The lower the level, the smaller the sound change is detected.



- The audio detection level is designed to normalize the input data to a value between 1 and 100 and detect the signal larger than threshold level. It is unrelated to the decibel (dB) level.

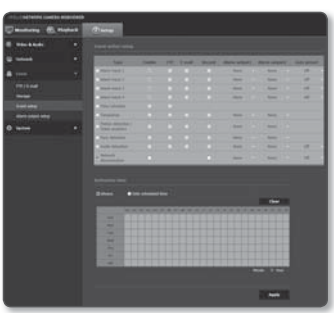
6. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 105)
7. When done, click [**Apply (** Apply **)**].

- If detected audio level is too low, set the audio input gain to a higher level in <**Audio setup**>.

Network disconnection

You can receive and save events of a physically disconnected network.

1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Event setup**>.
3. Select <**Network disconnection**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 105)
6. When done, click [**Apply (** Apply **)**].



Alarm output setup

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Alarm output setup**>.
3. Set the camera's type of alarm output.
   - If you change the alarm output type, the alarm out button on the monitoring page and alarm output type displayed on Event Setup page will be changed accordingly.
   - Type
     - Normal open : Considers "Open circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Closed circuit" status.
     - Normal close : Considers "Closed circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Open circuit" status.
4. Set the alarm output button.
   - Button mode : Sets the alarm output method.
     - There is difference between operations when clicked alarm output button while disabled.
     - Pulse : It is activated during the time period specified by the duration (switching interval) and then becomes inactive automatically.
     - Active/Inactive : It maintains as activated until the user clicks the button again to make it inactive.
   - Duration : Set the alarm duration that maintains activated if the mode is set to pulse, from 1 to 15 seconds.
5. When done, click [**Apply (** **)**].

SYSTEM SETUP

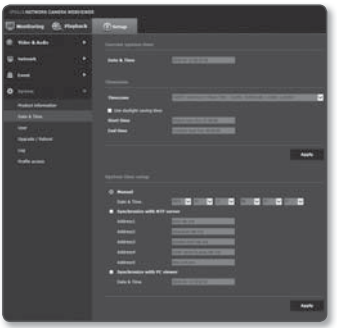
Product information

1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Product information**>.
3. Check the camera information, or provide details according to your network environment.
   - Model : Model name of the product.
   - Serial number : Product serial number.
   - Device name : Provide a device name that will be displayed on the Live screen.
   - Location : Specify the location where the camera is installed.
   - Description : Provide detailed information about the camera location.
   - Memo : Provide an explanation about the camera for better understanding.
   - Language : Select a preferred language for the Web Viewer OSD.

   ▪ The default language is set to <**English**>.

4. When done, click [**Apply (** **)**].

Date & Time

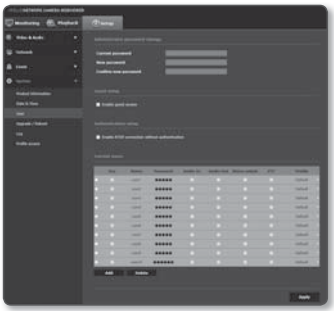


1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Date & Time**>.
3. Specify the time and date that will be applied to the camera.
   - Current system time : Displays the current time settings of your system.
   - Timezone : Specify the local time zone based on the GMT.
   - Use daylight saving time : If checked, the time will be set one hour before the local time zone for the specified time period. This option will be displayed only in areas where DST is applied.
   - System time setup : Specify the time and date that will be applied to your system.
     - Manual : Specify the time manually.
     - Synchronize with NTP server : Sync with the time of the specified server address.
     - Synchronize with PC viewer : Sets to the time of the computer connected.
4. When done, click [**Apply (** **Apply** **)**].

■ If you select the <**Synchronize with PC viewer**>, the standard timezone should be set the same as the current timezone in PC.

User

1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**User**>.
3. Provide the necessary user information.
   - Administrator password change : Change the password for the administrator.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- It is recommended to change your password once every three months.
- The password length and limits are shown as follows.
  - A combination of at least two types of upper case, lower case, numeric, and special characters: 8 to 15 characters.
  - Should be different from the ID.
  - Cannot repeat the same letter, number of special characters more than three times.
  - Cannot use three consecutive letters (e.g. abc, 123, 321, or ascii code values in the sequential increasing or decreasing order)
  - Special characters that are allowed. : ~`!@#$%^*()_-+=|{}[].?/
  - After the factory setting, the admin and user passwords are initialized. You need to reset the password.
  - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
  - In this menu, you need to login again with the new password before using the camera web page menus.

- If the existing password is not matched, when you change the admin password, you cannot change the password.
- After changing your password, if there is a camera connected to a CMS or NVR client, then you need to re-register it with the newly changed password. If the camera is still connected with the same password, then the account may be locked because a client uses the previous password.

▪ If you try to login with the registered account, 5 or more consecutive password authentication has failed, and then the account may be locked for thirty seconds.

▪ When the password is changed while multiple connections are active from a PC, the browser may malfunction. In that case, reconnect to the server.

- Guest setup : If you select <**Enable guest access**>, the guest account can access the Web viewer screen but can only view the live Viewer screen.
  - ▪ The ID/password for the guest account is <**guest/guest**>, which cannot be changed.
- Authentication setup : If you select <**Enable RTSP connection without authentication**>, you can access RTSP without logging in and view the video.
- Current users : If you select <**Use**>, you can set or change the user permissions.
  - ▪ The administrator can set the audio input, audio output, alarm output and PTZ control permissions.
  - ▪ Profile : If you select <**Default**>, you can only see the default profile video; if selecting <**All**>, you can see the full profile videos.

▪ ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.

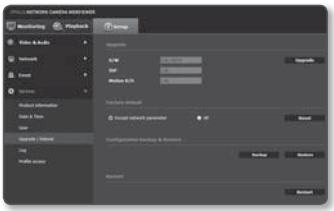
▪ Video Transfer and Changing Video Information: Set the profile to <**All**>, and set Audio Input and Audio Output.

▪ Video Transfer, Changing Video Information, Alarm Output : Set the profile to <**All**>, and select at your preference for the rest.

▪ PTZ control : Select <**PTZ**>.

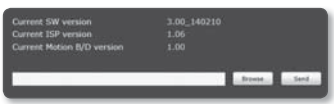
4. When done, click [**Apply (** Apply **)**].

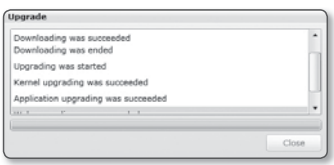
Upgrade / Reboot



1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Upgrade / Reboot**>.
3. Select a desired item and set it appropriately.
   - Upgrade : Performs upgrading the system.
   - Factory default : Resets the system to the factory default.
     - Except network parameter : Reset the other settings except for Network settings.
     - All : Resets all settings including the camera settings. (however, the log information will not be reset)
       - The IP addressing system will be defaulted to DHCP if you reset the camera. If no DHCP server is found, the previous settings will be restored automatically.
   - Configuration backup & Restore : Backs up the current system settings before performing the restoration process. The system is automatically restarts after backup or restoration.
   - Restart : Restarts the system.

To perform the upgrade



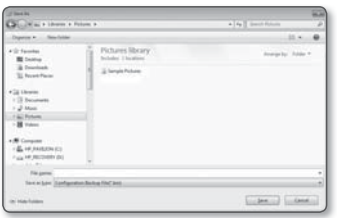


1. Click [**Upgrade**].
2. Click [**Browse**] and specify a file to upgrade.
3. Click [**Send**].
4. The "**Upgrade**" dialog appears where the progression will be shown in the bottom.
5. Once completed upgrading, the browser exits and the camera restarts.

- It may take a max of 10 minutes for the upgrade process.
  If you forcibly terminate the upgrade process, upgrade will not be completed properly.
- During restarting the system, accessing with web viewer will not be made.
- You can download the latest version from the Samsung web site (www.samsungcctv.com).

To back up the current settings

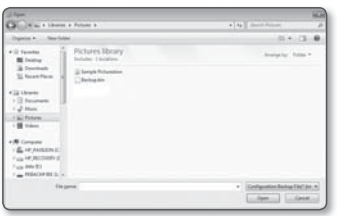
1. Click [**Backup**].
   The Save As dialog should appear.
2. Specify the backup path with a proper file name, and click [**Save**].
   The backup file will be saved to the specified path in the format of "**.bin**".



To restore the backup settings

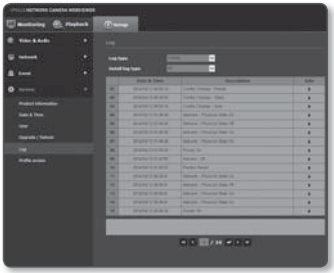
1. To restore the backup settings, click [**Restore**].
2. Select a backup file and click [**Open**].

- If you perform the backup or restoration, the web browser will be closed and the camera will reboots.
- You can restore a backup file for the SNP-6201/SNP-6201H model only.



Log

You can check the system log or event log.



1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Log**>.
3. Select a log type.
   - System : You can check the system logs where any system changes are recorded including the time information.
   - Event : You can check the event logs including the time information.
4. From the right log list, select an item to search for.
   - If you select <**All**> in the top left dropdown list, all logs for the applicable log type will be displayed.
5. If one page can not display all the logs available, use the bottom buttons to move to the previous, next, or the last item.

- If you want to view the details of a log, click [**Info (** **)**] in the right column of the log; the log information will be shown in the bottom pane.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing logs will be deleted from the oldest one each time a new log is created.

Profile access

You can check the profile information.

1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Profile access**>.
   - Profile access : Show the information of the newly added profile.
     - Profile : Show the information of the newly added codec.
     - Bitrate(kbps) : Show both the actual bit rate and the set bit rate.
     - Framerate(fps) : Show both the actual frame rate and the set frame rate.
     - ATC(%) : Show the ATC status.
     - Concurrent users count : Show the number of concurrent users who access the profile.
   - Current users : Shows information on users accessing web viewer and displaying monitoring video.
     - Profile : Show the name of the profile accessed by the user.
     - Bitrate(kbps) : Show the current bit rate.
     - Network connection status : You can check the network connection status.
     - IP : Show the IP address of the current user.

▪ To check information on the profile currently used, click <**Profile access**> again to refresh it.

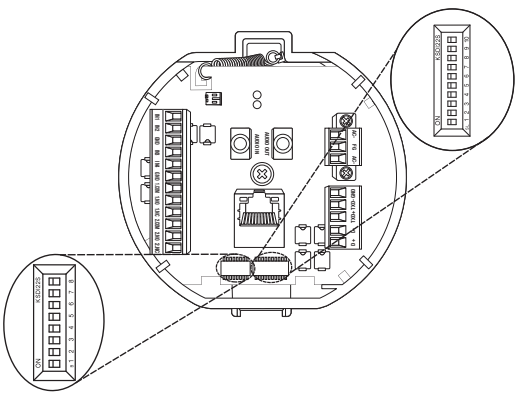
DIP SWITCH SETTING

How to set up Protocols and ID DIP Switches

You can control various settings of the camera system using the Communication and ID DIP switches. Before installing the product, please set up the DIP switches according to the installation environment.

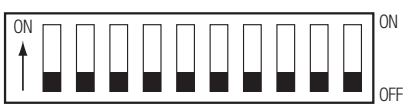
1. Set the switches according to your installation environment. For more detailed setup information, please refer to the chart on the next page.
2. The camera may malfunction if the switches are not fully turned On/Off; please double check the switches before finishing setup.
3. Be cautious that the switch can be damaged when it is operated with a sharp tool.
4. Be cautious that the switch can be damaged when it is operated with an excessive force.

Communication Protocol DIP Switch (SW2)



Camera ID DIP Switch (SW1)

Communication Protocol DIP Switch Settings (SW2)



SW2

SW2 Pin No.	Purpose
1~4	Protocol Settings
5~6	Baud Rate Settings
7	Transfer Method (RS-485/422) Settings
8	Termination Settings 1
9	Termination Settings 2
10	Response Mode Settings

- **Protocol Settings**

Select a communication protocol for the camera.

No.	Protocol	SW2-#1	SW2-#2	SW2-#3	SW2-#4
1	Samsung(Default)	OFF	OFF	OFF	OFF
2	Pelco-D	OFF	OFF	OFF	ON
3	Pelco-P	OFF	OFF	ON	OFF
4	Samsung Elec.	OFF	OFF	ON	ON
5	Panasonic	OFF	ON	OFF	OFF
6	Vicon	OFF	ON	OFF	ON
7	Honeywell	OFF	ON	ON	OFF
8	AD	OFF	ON	ON	ON
9	GE	ON	OFF	OFF	OFF
10	BOSCH	ON	OFF	OFF	ON
11	Reserved	ON	OFF	ON	OFF
12	Reserved	ON	OFF	ON	ON
13	Reserved	ON	ON	OFF	OFF
14	Reserved	ON	ON	OFF	ON
15	Reserved	ON	ON	ON	OFF
16	Reserved	ON	ON	ON	ON

• **Baud Rate Settings**

Select the transfer speed of a selected communication protocol.

No.	Baud Rate (BPS)	SW2-#5	SW2-#6
1	2400	ON	ON
2	4800	ON	OFF
3	9600 (Default)	OFF	OFF
4	19200	OFF	ON

• **Communication Method Settings**

Select a communication method for the camera.

	Function	ON	OFF
SW2-#7	Transfer Mode Switch	RS-422(4Wire)	RS-485(2Wire)

• **Communication Response Settings**

Select a communication response method for the camera and controller: Response or No Response.

	Function	ON	OFF
SW2-#10	Response Mode Switch	Response	No Response

• **Termination Settings**

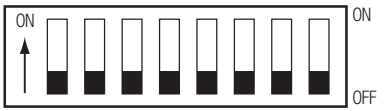
To prevent the attenuation of communication signals between the camera and controller, the items at the end of line must be set up with the termination settings.

Camera Input Position	SW2-#8	SW2-#9
Termination of Longest Path	ON	ON
On the Path	OFF	OFF

- The default value is shaded in each setting table.
- To use a third party controller with this product, please contact our After-Sales Service or Technology Department.

Camera ID DIP Switch Settings (SW1)

To set up camera IDs, refer to the "**Camera ID Chart**" next.



SW1

- **Camera ID Chart**

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
1	ON/OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF
72	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
73	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
74	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
75	ON	ON	OFF	ON	OFF	OFF	ON	OFF
76	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
77	ON	OFF	ON	ON	OFF	OFF	ON	OFF
78	OFF	ON	ON	ON	OFF	OFF	ON	OFF
79	ON	ON	ON	ON	OFF	OFF	ON	OFF
80	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
81	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
82	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
83	ON	ON	OFF	OFF	ON	OFF	ON	OFF
84	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
85	ON	OFF	ON	OFF	ON	OFF	ON	OFF
86	OFF	ON	ON	OFF	ON	OFF	ON	OFF
87	ON	ON	ON	OFF	ON	OFF	ON	OFF
88	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
89	ON	OFF	OFF	ON	ON	OFF	ON	OFF
90	OFF	ON	OFF	ON	ON	OFF	ON	OFF
91	ON	ON	OFF	ON	ON	OFF	ON	OFF
92	OFF	OFF	ON	ON	ON	OFF	ON	OFF
93	ON	OFF	ON	ON	ON	OFF	ON	OFF
94	OFF	ON	ON	ON	ON	OFF	ON	OFF
95	ON	ON	ON	ON	ON	OFF	ON	OFF
96	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
97	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
98	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
99	ON	ON	OFF	OFF	OFF	ON	ON	OFF
100	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
101	ON	OFF	ON	OFF	OFF	ON	ON	OFF
102	OFF	ON	ON	OFF	OFF	ON	ON	OFF
103	ON	ON	ON	OFF	OFF	ON	ON	OFF
104	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
105	ON	OFF	OFF	ON	OFF	ON	ON	OFF
106	OFF	ON	OFF	ON	OFF	ON	ON	OFF

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
107	ON	ON	OFF	ON	OFF	ON	ON	OFF
108	OFF	OFF	ON	ON	OFF	ON	ON	OFF
109	ON	OFF	ON	ON	OFF	ON	ON	OFF
110	OFF	ON	ON	ON	OFF	ON	ON	OFF
111	ON	ON	ON	ON	OFF	ON	ON	OFF
112	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
113	ON	OFF	OFF	OFF	ON	ON	ON	OFF
114	OFF	ON	OFF	OFF	ON	ON	ON	OFF
115	ON	ON	OFF	OFF	ON	ON	ON	OFF
116	OFF	OFF	ON	OFF	ON	ON	ON	OFF
117	ON	OFF	ON	OFF	ON	ON	ON	OFF
118	OFF	ON	ON	OFF	ON	ON	ON	OFF
119	ON	ON	ON	OFF	ON	ON	ON	OFF
120	OFF	OFF	OFF	ON	ON	ON	ON	OFF
121	ON	OFF	OFF	ON	ON	ON	ON	OFF
122	OFF	ON	OFF	ON	ON	ON	ON	OFF
123	ON	ON	OFF	ON	ON	ON	ON	OFF
124	OFF	OFF	ON	ON	ON	ON	ON	OFF
125	ON	OFF	ON	ON	ON	ON	ON	OFF
126	OFF	ON	ON	ON	ON	ON	ON	OFF
127	ON	ON	ON	ON	ON	ON	ON	OFF
128	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
129	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
130	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
131	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
132	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
133	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
134	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
135	ON	ON	ON	OFF	OFF	OFF	OFF	ON
136	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
137	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
138	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
139	ON	ON	OFF	ON	OFF	OFF	OFF	ON
140	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
141	ON	OFF	ON	ON	OFF	OFF	OFF	ON
142	OFF	ON	ON	ON	OFF	OFF	OFF	ON
143	ON	ON	ON	ON	OFF	OFF	OFF	ON
144	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
145	ON	OFF	OFF	OFF	ON	OFF	OFF	ON

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
146	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
147	ON	ON	OFF	OFF	ON	OFF	OFF	ON
148	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
149	ON	OFF	ON	OFF	ON	OFF	OFF	ON
150	OFF	ON	ON	OFF	ON	OFF	OFF	ON
151	ON	ON	ON	OFF	ON	OFF	OFF	ON
152	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
153	ON	OFF	OFF	ON	ON	OFF	OFF	ON
154	OFF	ON	OFF	ON	ON	OFF	OFF	ON
155	ON	ON	OFF	ON	ON	OFF	OFF	ON
156	OFF	OFF	ON	ON	ON	OFF	OFF	ON
157	ON	OFF	ON	ON	ON	OFF	OFF	ON
158	OFF	ON	ON	ON	ON	OFF	OFF	ON
159	ON	ON	ON	ON	ON	OFF	OFF	ON
160	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
161	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
162	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
163	ON	ON	OFF	OFF	OFF	ON	OFF	ON
164	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
165	ON	OFF	ON	OFF	OFF	ON	OFF	ON
166	OFF	ON	ON	OFF	OFF	ON	OFF	ON
167	ON	ON	ON	OFF	OFF	ON	OFF	ON
168	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
169	ON	OFF	OFF	ON	OFF	ON	OFF	ON
170	OFF	ON	OFF	ON	OFF	ON	OFF	ON
171	ON	ON	OFF	ON	OFF	ON	OFF	ON
172	OFF	OFF	ON	ON	OFF	ON	OFF	ON
173	ON	OFF	ON	ON	OFF	ON	OFF	ON
174	OFF	ON	ON	ON	OFF	ON	OFF	ON
175	ON	ON	ON	ON	OFF	ON	OFF	ON
176	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
177	ON	OFF	OFF	OFF	ON	ON	OFF	ON
178	OFF	ON	OFF	OFF	ON	ON	OFF	ON
179	ON	ON	OFF	OFF	ON	ON	OFF	ON
180	OFF	OFF	ON	OFF	ON	ON	OFF	ON
181	ON	OFF	ON	OFF	ON	ON	OFF	ON
182	OFF	ON	ON	OFF	ON	ON	OFF	ON
183	ON	ON	ON	OFF	ON	ON	OFF	ON
184	OFF	OFF	OFF	ON	ON	ON	OFF	ON

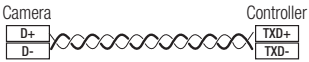
ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
185	ON	OFF	OFF	ON	ON	ON	OFF	ON
186	OFF	ON	OFF	ON	ON	ON	OFF	ON
187	ON	ON	OFF	ON	ON	ON	OFF	ON
188	OFF	OFF	ON	ON	ON	ON	OFF	ON
189	ON	OFF	ON	ON	ON	ON	OFF	ON
190	OFF	ON	ON	ON	ON	ON	OFF	ON
191	ON	ON	ON	ON	ON	ON	OFF	ON
192	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
193	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
194	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
195	ON	ON	OFF	OFF	OFF	OFF	ON	ON
196	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
197	ON	OFF	ON	OFF	OFF	OFF	ON	ON
198	OFF	ON	ON	OFF	OFF	OFF	ON	ON
199	ON	ON	ON	OFF	OFF	OFF	ON	ON
200	OFF	OFF	OFF	ON	OFF	OFF	ON	ON
201	ON	OFF	OFF	ON	OFF	OFF	ON	ON
202	OFF	ON	OFF	ON	OFF	OFF	ON	ON
203	ON	ON	OFF	ON	OFF	OFF	ON	ON
204	OFF	OFF	ON	ON	OFF	OFF	ON	ON
205	ON	OFF	ON	ON	OFF	OFF	ON	ON
206	OFF	ON	ON	ON	OFF	OFF	ON	ON
207	ON	ON	ON	ON	OFF	OFF	ON	ON
208	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
209	ON	OFF	OFF	OFF	ON	OFF	ON	ON
210	OFF	ON	OFF	OFF	ON	OFF	ON	ON
211	ON	ON	OFF	OFF	ON	OFF	ON	ON
212	OFF	OFF	ON	OFF	ON	OFF	ON	ON
213	ON	OFF	ON	OFF	ON	OFF	ON	ON
214	OFF	ON	ON	OFF	ON	OFF	ON	ON
215	ON	ON	ON	OFF	ON	OFF	ON	ON
216	OFF	OFF	OFF	ON	ON	OFF	ON	ON
217	ON	OFF	OFF	ON	ON	OFF	ON	ON
218	OFF	ON	OFF	ON	ON	OFF	ON	ON
219	ON	ON	OFF	ON	ON	OFF	ON	ON
220	OFF	OFF	ON	ON	ON	OFF	ON	ON
221	ON	OFF	ON	ON	ON	OFF	ON	ON
222	OFF	ON	ON	ON	ON	OFF	ON	ON

ID	SW1-#1	SW1-#2	SW1-#3	SW1-#4	SW1-#5	SW1-#6	SW1-#7	SW1-#8
223	ON	ON	ON	ON	ON	OFF	ON	ON
224	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
225	ON	OFF	OFF	OFF	OFF	ON	ON	ON
226	OFF	ON	OFF	OFF	OFF	ON	ON	ON
227	ON	ON	OFF	OFF	OFF	ON	ON	ON
228	OFF	OFF	ON	OFF	OFF	ON	ON	ON
229	ON	OFF	ON	OFF	OFF	ON	ON	ON
230	OFF	ON	ON	OFF	OFF	ON	ON	ON
231	ON	ON	ON	OFF	OFF	ON	ON	ON
232	OFF	OFF	OFF	ON	OFF	ON	ON	ON
233	ON	OFF	OFF	ON	OFF	ON	ON	ON
234	OFF	ON	OFF	ON	OFF	ON	ON	ON
235	ON	ON	OFF	ON	OFF	ON	ON	ON
236	OFF	OFF	ON	ON	OFF	ON	ON	ON
237	ON	OFF	ON	ON	OFF	ON	ON	ON
238	OFF	ON	ON	ON	OFF	ON	ON	ON
239	ON	ON	ON	ON	OFF	ON	ON	ON
240	OFF	OFF	OFF	OFF	ON	ON	ON	ON
241	ON	OFF	OFF	OFF	ON	ON	ON	ON
242	OFF	ON	OFF	OFF	ON	ON	ON	ON
243	ON	ON	OFF	OFF	ON	ON	ON	ON
244	OFF	OFF	ON	OFF	ON	ON	ON	ON
245	ON	OFF	ON	OFF	ON	ON	ON	ON
246	OFF	ON	ON	OFF	ON	ON	ON	ON
247	ON	ON	ON	OFF	ON	ON	ON	ON
248	OFF	OFF	OFF	ON	ON	ON	ON	ON
249	ON	OFF	OFF	ON	ON	ON	ON	ON
250	OFF	ON	OFF	ON	ON	ON	ON	ON
251	ON	ON	OFF	ON	ON	ON	ON	ON
252	OFF	OFF	ON	ON	ON	ON	ON	ON
253	ON	OFF	ON	ON	ON	ON	ON	ON
254	OFF	ON	ON	ON	ON	ON	ON	ON
255	ON	ON	ON	ON	ON	ON	ON	ON

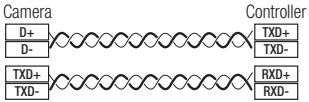
CAMERA WIRING

Control Signal Connection

- RS-485 Communications

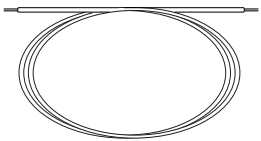


- RS-422 Communications



Communications Cable

For the camera to communicate with the controller, a RS-485/422 communications line is required.



- A 30m or shorter length is recommended for the connection.
- The communication cable is not enclosed with the camera.

SPECIFICATION

Items		Description	
		SNP-6201	SNP-6201H
Video	Imaging Device	1/3" Progressive Scan CMOS	
	Total Pixels	2,010(H) x 1,108(V) 2.2M Pixels	
	Effective Pixels	1,944(H) x 1,092(V) 2.1M Pixels	
	Scanning System	Progressive Scan	
	Min. Illumination	Color : 1.5 Lux @ F1.6 (50IRE) 0.02 Lux (Sens up 60X) B/W : 0.1 Lux @ F1.6 (50IRE) 0.001 Lux (Sens up 60X)	
Lens	Focal Length (Zoom Ratio)	4.45 ~ 89mm (20X)	
	Max. Aperture Ratio	F1.6(Wide) / F2.9(Tele)	
	Angular Field of View	H : 63°(Wide) ~ 3.49°(Tele), V : 37°(Wide) ~ 1.99°(Tele)	
	Min. Object Distance	INDOOR : 1.0m	OUTDOOR : 1.0m
	Focus Control	Auto / One-Shot AF / Manual	
	Lens Type	DC Auto Iris	
	Mount Type	Board-in type	
Pan / Tilt / Rotate	Pan Range	360° Endless	
	Pan Speed	Preset : 500°/sec, Manual : 0.024°/sec ~120°/sec	
	Tilt Range	210° (-15° ~ 195°)	
	Tilt Speed	Preset : 500°/sec, Manual : 0.024°/sec ~120°/sec	
	Rotate Range	-	
	Preset	255 ea	
	Preset Accuracy	±0.2°	
	Auto Tracking	N/A	

Items		Description	
		SNP-6201	SNP-6201H
Operational	Camera Title	Off / On (Displayed up to 15 characters)	
	Day & Night	Auto (ICR) / Color / B/W	
	Backlight Compensation	Off / BLC / WDR / HLC	
	Wide Dynamic Range	60dB	
	Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)	
	Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / Low / Medium / High)	
	Digital Image Stabilization	Off / On	
	Motion Detection	Yes	
	Privacy Masking	Off / On (12 Rectangle programmable zones)	
	Sens-up (Frame Integration)	Off / Auto (2X ~ 60X)	
	Gain Control	Off / Low / Medium / High / Manual	
	White Balance	AWC, Manual, Indoor, Outdoor, ATW (2,400°K ~ 11,000°K)	
	Electronic Shutter Speed	ESC / FLK / Manual (1/30 ~ 1/33,000)	
	Digital Zoom	8X	
	Flip / Mirror	Off / On	
	Intelligent Video Analytics	Tampering , Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection(5EA)	
	Schedule	-	
	Alarm I/O	Input 4ea / Output 2ea	
	Remote Control Interface	RS-485/422	
	RS-485 Protocol	SAMSUNG-T/E, PELCO-P/D, Panasonic, Honeywell, AD, Vicon, GE, BOSCH	
	Alarm Triggers	Alarm Input, Tampering, Motion Detection, Video Analytics, Face Detection, Audio Detection, Network Disconnect	

Items		Description	
		SNP-6201	SNP-6201H
Operational	Alarm events	• File upload via FTP, E-Mail • Notification via E-Mail, TCP • Local storage(SD/SDHC) recording at Network disconnected • External output • PTZ preset	
Network	Ethernet	RJ-45 (10/100BASE-T)	
	Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG	
	Resolution	1920x1080P(Full HD), 1280x1024, 1280x960, 1280x720P(HD), 1024x768, 800x600, 800x450, 640x480, 640x360, 320x240, 320x180	
	Max. Framerate	Max 30fps at all resolutions * When WDR ON, Max. framerate is Max 15fps.	
	Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control	
	Bitrate Control Method	H.264 : CBR or VBR Motion JPEG : VBR	
	Streaming Capability	Multiple Streaming (Up to 6 Profiles)	
	Audio I/O	Mic(Line)-in Selectable via UI, Line-out (Mono, 1Vrms)	
	Audio Compression Format	G.711 μ-law, G.726	
	Audio Communication	Bi-dierctional (2-Way)	
	IP	IPv4, IPv6	
	Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP	

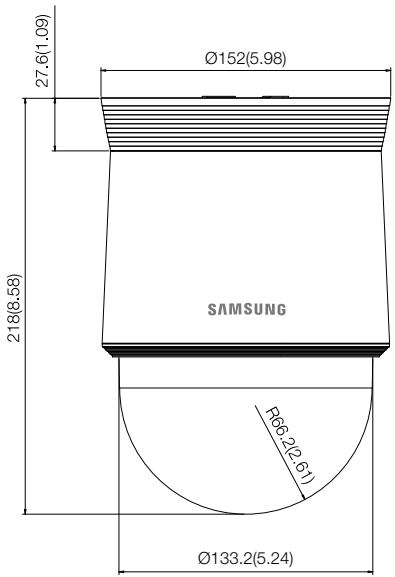
Items		Description	
		SNP-6201	SNP-6201H
Network	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication	
	Streaming Method	Unicast / Multicast	
	Max. User Access	10 users at Unicast Mode	
	Memory Slot	SD/SDHC Memory Slot	
	ONVIF Conformance	Yes	
	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norway, Finland	
	Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 10 ~ 7) Mozilla Firefox (Ver. 19 ~9) * Windows Only Google Chrome (Ver. 25 ~ 15) * Windows Only Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) * Mac OS X only	
	Central Management Software	Smart Viewer 4.0	
Environmental	Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / 20% ~ 80% RH	-50°C ~ +55°C (-58°F ~ +131°F) / ~ 90% RH (AC24V Mode), -30°C ~ +55°C (-22°F ~ +131°F) / ~ 90% RH (PoE+ Mode) * The low temperature condition means the calm condition with no external wind.
	Ingress Protection	-	IP66
	Vandal Resistance	SHP-3701H : IK10 Accessary Housing	-

Items		Description	
		SNP-6201	SNP-6201H
Electrical	Input Voltage / Current	24V AC, PoE+(IEEE802.3at)	
	Power Consumption	15W (AC24V), 13W (PoE+)	15W (AC24/PoE+, Heater Off), 53W (AC24V Heater On), 25W (PoE+ Heater On)
Mechanical	Color / Material	Ivory / Plastic	Ivory / Aluminum / Plastic Sun-Shield
	Dimension (Ø x H)	Ø152.0 x H218.0 mm	Ø220.0 x H293.6 mm
	Weight	1.8kg	3.2kg

PRODUCT OVERVIEW

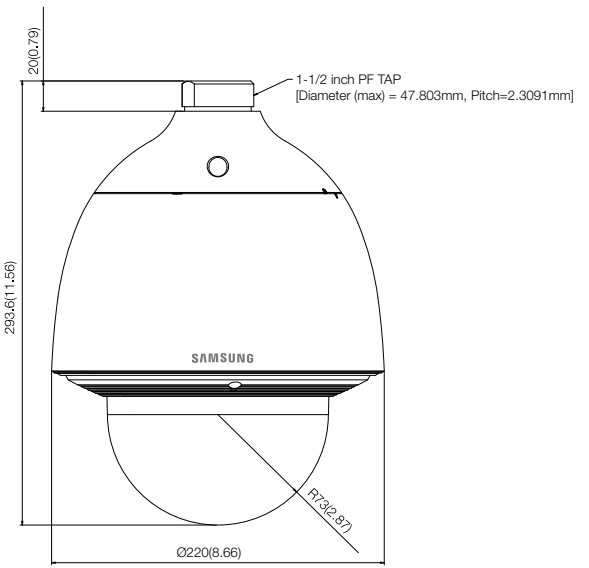
- SNP-6201

Unit : mm (inch)



▪ SNP-6201H

Unit : mm (inch)



TROUBLESHOOTING

PROBLEM	SOLUTION
I can't access the camera from a web browser.	• Check to make sure that the camera's Network settings are appropriate. • Check to make sure that all network cables have been connected properly. • If connected using DHCP, verify that the camera is able to acquire dynamic IP addresses without any problem. • If the camera is connected to a Broadband Router, verify that port forwarding is properly configured.
Viewer got disconnected during monitoring.	• Connected Viewers become disconnected upon any change to camera or network configurations. • Check all network connections. • If the camera is connected over an PPPoE network, it' s possible for Viewer to disconnect under poor network conditions.
I cannot connect to the system using a tab browser of Internet Explorer 7.0.	• An error may be generated when connecting with a new window or tab since the cookie data are shared. Do not use a new window or tab, select "File → New session".
The camera connected to the network is not detected in the IP installer program.	• Turn off the firewall settings on your PC and then search the camera again.
Images overlap.	• Check whether two or more cameras are set to a single multicast address instead of different addresses. If a single address is used for multiple cameras, the images may overlap.
No image appears.	• If the transmission method is set to multicast, check whether there is a router that supports multicast in the LAN the camera is connected to.

PROBLEM	SOLUTION
<Motion detection / Video analytics> of <Event setup> is set to <Enable>, but no notification e-mail reaches me even when an analysis event had occurred.	• Verify the settings in the following sequence: A. Check <Data & Time> settings. B. The <Motion detection / Video analytics> should be set to <Enable>. C. Check if the <E-mail> option of <Event action setup> menu is checked to use.
Can I define event rules even when I don't use <Motion detection / Video analytics>?	• Yes, it can be. You can set rules for events despite of the intelligent video analysis setting.
No signal is found at the Alarm Output port even when an intelligent video analysis event is generated.	• Check alarm output port settings.
Cannot record into the SD memory card.	• Check if the memory card is defective. • Check if the write protection tab of the memory card is set to "LOCK".
SD memory card is inserted but the camera does not operate properly.	• Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit • Format the memory card again in <Setup> → <Event> → <Record> menu.
Cannot format the SD memory card.	• Check if the write protection tab of the memory card is set to "LOCK".

OPEN SOURCE LICENSE NOTIFICATION ON THE PRODUCT

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to help.cctv@samsung.com

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution might be charged.

- GPL Software : linux kernel, uboot, Sysvinit, busybox-1.15.3 (http://www.busybox.net/), Net-snmp 5.4 (http://www.net-snmp.org), dvsdk 2.10.01.18
- LGPL Software : glibc-2.0 (http://www.gnu.org/software/libc/),
- BSD1.0 : math-linux (http://sourceforge.net/projects/math-linux/)
- BSD2.0 : lighttpd-1.4.26 (http://www.lighttpd.net/), MiniUPnP Project Client (http://miniupnp.tuxfamily.org/)
- MIT License : Prototype JavaScript Framework-1.7 (http://prototypejs.org/)
- libxml2 License : libxml2 (http://xmlsoft.org/)
- OpenSSL License : openssl-0.9.8 (http://www.openssl.org/)
- PHP 3.01 License : php-5.3.2 (http://www.php.net/)

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C)1989, 1991 Free Software Foundation, Inc. 51 Franklin Street,Fifth Floor, Boston, MA 02110-1301, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software-- to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too. When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs ; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have.

You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights. We protect your rights with two steps :

(1)copyright the software, and (2)offer you this license which gives you legal permission to copy, distribute and/or modify the software. Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all. The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc. 51 Franklin S

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License.

The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law : that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".
Activities other than copying, distribution and modification are not covered by this License ; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty ; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions :

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively when run,you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception:if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you ; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program. In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program)on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2)in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following :

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machinereadable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.) The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable. If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License.

However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works.

These actions are prohibited by law if you do not accept this License.Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise)that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all.

For example, if a patent license would not permit royaltyfree redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances. It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent

application of that system ; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries,so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/ or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation ; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/ OR OTHER PARTIES PROVIDE THE PROGRAM "ASIS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAMPROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty ; and each file should have at least the "copyright" line and a pointer to where the full notice is found.one line to give the program's name and an idea of what it does.

Copyright (C)yyyy name of author

This program is free software ; you can redistribute it and/or modify it under the terms of the GNU General Public License

as published by the Free Software Foundation ; either version 2 of the License, or (at your option)any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY ; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program ; if not, write to the Free Software Foundation, Inc.,51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.
Also add information on how to contact you by electronic and paper mail. If the program is interactive, make it output a short notice like this when it starts in an interactive mode :

Gnomovision version 69, Copyright (C) year name of author

Gnomovision comes with ABSOLUTELY NO WARRANTY ; for details type 'show w'. This is free software, and you are welcome to redistribute it under certain conditions ; type 'show c' for details.

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than 'show w' and 'show c' ; they could even be mouse-clicks or menu items-- whatever suits your program.

You should also get your employer (if you work as a programmer)or your school, if any, to sign a "copyright disclaimer" for the program,if necessary. Here is a sample ; alter the names:

Yoyodyne, Inc..hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker. signature of Ty Coon, 1 April 1989 Ty Coon, President of Vice This General Public License does not permit incorporating

your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is

Lwihcaetn ysoeu want to do, use the GNU Lesser General Public instead of this License.

GNU GENERAL PUBLIC LICENSE

Version 3, 29 June 2007

Copyright (C) 2007 Free Software Foundation, Inc. <http:// fsf. org/>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works. The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users.

We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors.

You can apply it to your programs, too. When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.
For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights. Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it. For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions. Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose omputers, but in those that do, we wish to avoid the special anger that patents applied to a free program could make it ffectively proprietary. To prevent this, the GPL assures that atents cannot be used to render the program non-free. he precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.
"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.
"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.
To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.
A "covered work" means either the unmodified Program or a work based on the Program.
To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.
To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying. An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or generalpurpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.
The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source. The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you. Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program. You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

a) The work must carry prominent notices stating that you modified it, and giving a relevant date.

b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".

c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so. A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d. A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work. A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in

favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made. If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network. Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions. When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission. Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or

b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or

c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

d) Limiting the use for publicity purposes of names of licensors or authors of the material; or

e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors. All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying. If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms. Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11). However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation. Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you ofthe violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice. Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License. An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts. You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version". A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License. Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party. If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid. If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it. A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license

(a) in connection with copies of the covered work conveyedby you (or copies made from those copies), or

(b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007. Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of thisLicense. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation. If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program. Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.
51Franklin Street, Fifth Floor, Boston, MA 02110-1301

USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed. [This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages-typically libraries-of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below. When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights. We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library. To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license. Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library.

The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom.

The Lesser General Public License permits more lax criteria for linking other code with the library. We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries.

However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, nonfree programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in nonfree programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/ Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library. The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".) "Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change. c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License. d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful. (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.) These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.
In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices. Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy. This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided t hat you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the

Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.) Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications. You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking withthe Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy. For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable. It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot istribute so as to satisfy simultaneously your obligations nder this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found. one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/ or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Also add information on how to contact you by electronic and paper mail. You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names: Yoyodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker. signature of Ty Coon, 1 April 1990 Ty Coon, President of Vice.

Copyright (c) 1998-2000 University College London

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, is permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the

Computer Science Department at University College London

4. Neither the name of the University nor of the Department may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHORS AND CONTRIBUTORS "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2004, Jan Kneschke, incremental

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2004, Kneschke, incremental

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met :

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2005-2010, Thomas BERNARD

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The MIT License

Copyright (c) 1996 by Internet Software Consortium

Copyright (c) 2005-2010 Sam Stephenson

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense,

and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

libxml2 License

Except where otherwise noted in the source code (e.g. the files hash.c, list.c and the trio files, which are covered by a similar licence but with different Copyright notices) all the files are:

Copyright (C) 1998-2003 Daniel Veillard. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE DANIEL VEILLARD BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of Daniel Veillard shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from him.

OpenSSL LICENSE

Copyright (c) 1998-2006 The OpenSSL Project. All rights

reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http:// www.openssl.org/)"

4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.

5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.

6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson(tjh@cryptsoft.com).

Original SSLEAY License

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft. com)

All rights reserved. This package is an SSL implementation written by Eric Young (eay@cryptsoft. com). The implementation was written so as to conform with Netscapes SSL. This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com). Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. All advertising materials mentioning features or use of this software must display the following acknowledgement:

"This product includes cryptographic software written by Eric Young (eay@ cryptsoft.com)" The word 'cryptographic' can be left out if the rouines from the library being used are not cryptographic related :-).

4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG “AS IS AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

PHP License

The PHP License, version 3.01

Copyright (c) 1999 - 2012 The PHP Group. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, is permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name “PHP” must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact group@php.net.
4. Products derived from this software may not be called “PHP”, nor may “PHP” appear in their name, without prior written permission from group@php.net. You may indicate that your software works in conjunction with PHP by saying “Foo for PHP” instead of calling it “PHP Foo” or “phpfoo”
5. The PHP Group may publish revised and/or new versions of the license from time to time. Each version will be given a distinguishing version number.
   Once covered code has been published under a particular version of the license, you may always continue to use it under the terms of that version. You may also choose to use such covered code under the terms of any subsequent version of the license published by the PHP Group. No one other than the PHP Group has the right to modify the terms applicable to covered code created under this License.
6. Redistributions of any form whatsoever must retain the following acknowledgment:
   “This product includes PHP software, freely available from <http://www.php.net/software/>”.
   THIS SOFTWARE IS PROVIDED BY THE PHP DEVELOPMENT TEAM “AS IS” AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE PHP DEVELOPMENT TEAM OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This software consists of voluntary contributions made by many individuals on behalf of the PHP Group.
The PHP Group can be contacted via Email at group@php.net.
For more information on the PHP Group and the PHP project, please see <http://www.php.net>.
PHP includes the Zend Engine, freely available at <http://www.zend.com>.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

eco
RoHS compliant

Samsung Techwin cares for the environment at all product manufacturing stages, and is taking measures to provide customers with more environmentally friendly products.
The Eco mark represents Samsung Techwin's devotion to creating environmentally friendly products, and indicates that the product satisfies the EU RoHS Directive.

Correct Disposal of This Product (Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Correct disposal of batteries in this product

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

SALES NETWORK

SAMSUNG TECHWIN CO., LTD.
Samsung Techwin R&D Center, 6, Pangyo-ro 319beon-gil, Bundang-gu, Songnam-si, Gyeonggi-do 463-400, Korea
TEL : +82-70-7147-8740~60 FAX : +82-31-8018-3745

SAMSUNG TECHWIN AMERICA Inc.
100 Challenger Rd. Suite 700 Ridgefield Park, NJ 07660
Toll Free : +1-877-213-1222 Direct : +1-201-325-6920
Fax : +1-201-373-0124
www.samsungcctvusa.com

SAMSUNG TECHWIN EUROPE LTD.
Samsung House, 1000 Hillswood Drive, Hillswood Business Park Chertsey, Surrey, UNITED KINGDOM KT16 OPS
TEL : +44-1932-45-5300 FAX : +44-1932-45-5325

www.samsungtechwin.com
www.samsungsecurity.com
www.samsungipolis.com